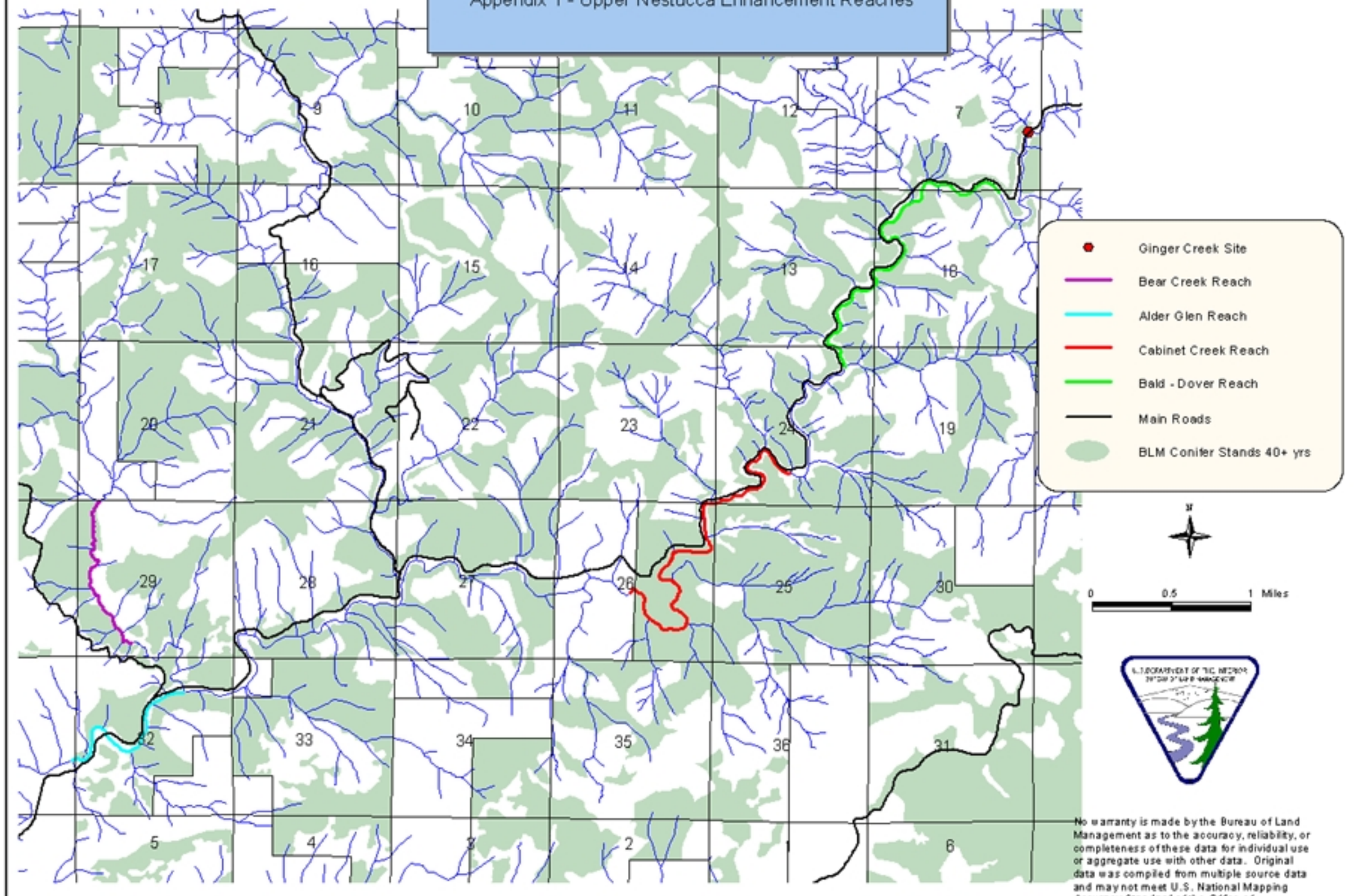
Appendix 1 - Upper Nestucca Enhancement Reaches



APPENDIX 2

ENVIRONMENTAL ELEMENTS

Environmental Assessment Number OR-086-00-02

In accordance with law, regulation, executive order and policy, the Upper Nestucca Restoration and Enhancement Project interdisciplinary team reviewed the elements of the environment to determine if they would be affected by the proposed action described in Chapter 2 of the EA (environmental assessment). The following two tables summarize the results of that review. There was one major issue, fish and fish habitat identified by the interdisciplinary team through scoping (EA, Chapter 1.6). Chapter 3 contains a discussion of the environmental consequences related to the major issue, as well as the four other elements of the environment (i.e., vegetation, soil, water and wildlife). Appendix 4 and 5 contain additional supporting information on habitat conditions and the effects to ACS objectives.

Table 1. Critical Elements of the Environment. This table lists the critical elements of the environment which are subject to requirements specified in statute, regulation, or executive order and the interdisciplinary team's predicted environmental impact per element if the proposed action described in Chapter 2.2.2 of the Environmental Assessment was implemented.

CRITICAL ELEMENTS OF THE ENVIRONMENT	ENVIRONMENTAL EFFECT	INTERDISCIPLINARY TEAM'S COMMENTS
Air Quality	None	This element was not identified as a major issue.
Areas of Critical Environmental Concern	Minimal	This element was not identified as a major issue. There is limited activity expected within the Elk Creek ACEC and activities in a greater portion of the Nestucca ACEC. The proposed action is consistent with both of these ACEC Management Plans.

CRITICAL ELEMENTS OF THE ENVIRONMENT	ENVIRONMENTAL EFFECT	INTERDISCIPLINARY TEAM'S COMMENTS
Cultural, Historic, Paleontological	None	This element was not identified as a major issue. There ar no known cultural sites that would be affected by the proposed action, including the blowdown patches located T3S, R6W, Sec. 28 and T4S, R7W, Sec. 25-26. Pursuant the August 1998 protocol for managing cultural resources lands administered by the BLM in Oregon, the Coastal Range Inventory Plan only requires post-harvest surveys o slopes less than 20%. This survey protocol is applicable t the blowdown patches and the heavy equipment access routes to the stream reaches proposed for treatment. Additionally, the proposed fish habitat improvements are exempt undertaking (i.e., Protocol, Appendix E, Wildlife, #4) since the actions would be confined to the stream channels, including floodplains, which have been previous disturbed. If during the implementation of the projects cultural resources are found, the projects may be redesigne to protect the cultural resource values present, or evaluatio and mitigation procedures would be implemented based o recommendations from the District Archaeologist.
Native American Religious Concerns	None	This element was not identified as a major issue. Tribes were contacted during scoping and no concerns were identified (Project Record, Document 4).
Threatened or Endangered Plant Species or Habitat	See Chapter 3 of the EA	This element was not identified as a major issue. There are no known threatened or endangered plant species or habitat located within the project area.
Threatened or Endangered Wildlife Species or Habitat	See Chapter 3 of the EA	This element was not identified as a major issue. However, refer to Chapter 3 of the EA for a discussion of the environmental effects.

CRITICAL ELEMENTS OF THE ENVIRONMENT	ENVIRONMENTAL EFFECT	INTERDISCIPLINARY TEAM'S COMMENTS
Threatened or Endangered Fish Species or Habitat	See Chapter 3 of the EA	This element was identified as a major issue. Refer to Chapter 3 and Appendix 4 and 5 of the EA for a discussion of the environmental effects.
Prime or Unique Farm Lands	None	This element was not identified as a major issue. There is no prime or unique farm lands located within the project area.
Flood Plains	See Chapter 3 of the EA	This element was not identified as a major issue. However, refer to Chapter 3 and Appendix 4 and 5 of the EA for a discussion of the environmental effects. Restoration work will be conducted in accordance with the authorizations issued by the Oregon Division of State Lands and the United States Army Corps of Engineers.
Hazardous or Solid Wastes	None	This element was not identified as a major issue. There is not predicted to be any environmental effects associated with this element.
Water Quality (Surface and Ground)	See Chapter 3 of the EA	This element was not identified as a major issue. However, refer to Chapter 3 of the EA for a discussion of the environmental effects.
Wetlands/Riparian Zones (Executive Order 11990, Protection of Wetlands, 5/24/77)	See Chapter 3 of the EA	This element was not identified as a major issue. However, refer to Chapter 3 of the EA for a discussion of the environmental effects and Appendix 5 for Aquatic Conservation Strategy objectives.

CRITICAL ELEMENTS OF THE ENVIRONMENT	ENVIRONMENTAL EFFECT	INTERDISCIPLINARY TEAM'S COMMENTS
Wild and Scenic Rivers	Minimal	This element was not identified as a major issue. The Nestucca River is a State-designated scenic waterway and was found to be suitable for designation as a component of the National Wild and Scenic Rivers System with a tentative classification of "Recreational River Area". The proposed action complies with the pertinent regulations concerning the State Scenic Waterways Act. The proposed action is predicted to protect the outstandingly remarkable values (scenic, recreational and fish) identified for this recreational river area.
Wilderness	None	This element was not identified as a major issue. There is no wilderness located within the project area.
Invasive, Nonnative Species (includes Executive Order 13112, Invasive Species, 2/3/99)	See Chapter 3 of the EA	This element was not identified as a major issue. However, refer to Chapter 3 of the EA for a discussion of the environmental effects.

CRITICAL ELEMENTS OF THE ENVIRONMENT	ENVIRONMENTAL EFFECT	INTERDISCIPLINARY TEAM'S COMMENTS
Environmental Justice (including Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations" 2/11/94)	Minimal Affect	This element was not identified as a major issue. The projects implementation over a one to five year period would result in minimal impact to the local and regional economies. Additionally, in consideration of the information contained in the *Social Assessment of the Northern Coast Range Adaptive Management Area*, dated June 1997, the proposed action will not have a disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.

Table 2. Other Elements of the Environment. This table lists other elements of the environment which are subject to requirements specified in law, regulation, or policy and the interdisciplinary team's predicted environmental impact per element if the proposed action described in Chapter 2.2.2 of the Environmental Assessment was implemented.

ELEMENTS OF THE ENVIRONMENT	ENVIRONMENTAL EFFECT	INTERDISCIPLINARY TEAM'S COMMENTS
Land Uses (including mining claims, mineral leases, etc.)	None	This element was not identified as a major issue. There are no known mining claims, mineral leases, etc. located within the project area.

ELEMENTS OF THE ENVIRONMENT	ENVIRONMENTAL EFFECT	INTERDISCIPLINARY TEAM'S COMMENTS
Minerals	Minimal	This element was not identified as a major issue. The proposed action does include the extraction of rock boulders from existing quarries. Since small amounts are needed, this element will be minimally affected by the proposed action.
Recreation	Minimal Affect	This element was not identified as a major issue. The primary recreational use associated with the project area is hunting, fishing and camping. The proposed action would have minimal impact on the pursuit of these endeavors.
Soils	Minimal Affect	This element was not identified as a major issue. However, refer to Chapter 3 of the EA for a discussion of the environmental effects.
Visual Resources	None	This element was not identified as a major issue. This project lies within the BLM Class I, III and IV Visual Resource Management categories, IV states "allow for major modifications of existing character of landscapes", III states "partially retain the existing character of landscapes" and category I is to "preserve the existing character of the landscapes". The proposed action is consistent with this management guidance. (See Visual Contrast Rating Worksheet, Project Record Document 12)

ELEMENTS OF THE ENVIRONMENT	ENVIRONMENTAL EFFECT	INTERDISCIPLINARY TEAM'S COMMENTS
Water Resources (including Aquatic Conservation Strategy objectives, beneficial uses [Salem FEIS Chapter 3-9], DEQ 303d listed streams, water temperature, sedimentation, water quantity, etc.)	Minimal Affect See Chapter 3 of the EA	This element was identified as a part of the major issue as it relates to potential impacts to fish and fish habitat. Refer to Chapter 3 of the EA for a discussion of the environmental effects and Appendix 5 for consistency with Aquatic Conservation Strategy objectives.
Bureau Sensitive and Special Attention Plant Species/Habitat (including Survey and Manage, and protection buffer species)	Minimal Affect See Chapter 3 of the EA	This element was not identified as a major issue. However, refer to Chapter 3 of the EA for a discussion of the environmental effects.
Bureau Sensitive and Special Attention Wildlife Species/Habitat (including Survey and Manage, and protection buffer species)	Minimal Affect See Chapter 3 of the EA	This element was not identified as a major issue. However, refer to Chapter 3 of the EA for a discussion of the environmental effects.
Fish Species with Bureau Status	Minimal Affect See Chapter 3 of the EA	Refer to Chapter 3 and Appendix 4 and 5 of the EA for a discussion of the environmental effects.
Rural Interface Areas	None	This element was not identified as a major issue. There are no rural interface areas located within the project area.

ELEMENTS OF THE ENVIRONMENT	ENVIRONMENTAL EFFECT	INTERDISCIPLINARY TEAM'S COMMENTS
Coastal Zone (affect on "any land or water use or natural resource of the coastal zone". The determination of effects should include " direct, indirect, cumulative, secondary, and reasonably foreseeable effects")	Minimal Affect	The instream portion of the proposed action EA Chapter 2 is located within the Coastal Zone as defined by the Oregon Coastal Management Program. This portion of the proposed action appears to be consistent with the requirements of that plan.

APPENDIX 3

PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

Environmental Assessment Number OR-086-00-02

The past, present, and reasonably foreseeable future actions within the Nestucca Watershed are listed below. The details of those actions which are in bold text will be discussed later in this appendix. The cumulative effects of the past, present, and reasonably foreseeable future actions in relation to the relevant environmental elements will be analyzed in Chapter 3 of the Environmental Assessment.

Past Actions: * homestead settlement * high rate of logging in the 20th century with associated actions including railroad logging, splash dams, snag felling, construction of roads, milling, and blasting rock/removal of large wood from stream channels * Meadow Lake Dam failure in 1962 * management of young plantations * placement or creation of coarse woody debris and wildlife tree projects * changes in logging volumes *obliteration of approximately 6.7 miles of forest road within the Nestucca Watershed * recreational use including camping (including use of the **four BLM-managed recreation sites - Alder Glen, Elk Bend, Fan Creek, and Dovre and one United States Forest Service recreation site - Rocky Bend**), hunting, fishing, target practicing, rockhounding, sightseeing (including scenic driving along the **Nestucca River National Back Country Byway**), hiking, and motorcycle and bicycle riding * minor amount of mineral extraction (primarily gravel) * 1990's appreciable increase of population in-migration * primary and secondary residential development * agriculture *grazing *gathering of special forest products such as landscape transplants, floral greenery (i.e., mosses, ferns, salal, and tree boughs), Christmas trees, seed cones, berries, mushrooms, western red cedar shake bolts, and firewood * municipal and domestic uses of water * some resource theft, vandalism, and refuse dumping * fire, including prescribed fire (wildfire intervals ranging from 150 to 350 years) * road maintenance including **Blaine Road Phase I**, **1996 Flood Damage Repairs**, **Restoration of the Nestucca River and Bible Creek Access Roads,** and **Restoration of the Bald Mountain Access Road*** BLM fish habitat enhancement projects in the Nestucca Drainage, including Bear Creek, Elk Creek and the main Nestucca River.

Present Actions: * logging with harvest rates below historic levels * management of young plantations * recreational use including camping (including use of the four BLM- managed recreation sites - Alder Glen, Elk Bend, Fan Creek, and Dovre, and one United States Forest Service recreation site - Rocky Bend), hunting, fishing, target practicing, sightseeing (including scenic driving along the Nestucca River National Back Country Byway), and off-highway vehicle (including the **Upper Nestucca motorcycle trail system**) * recreational use proportional to in-migration, free time and economic affluence* agriculture * industry * creation of coarse woody debris and wildlife tree projects * minor amount of gathering of special forest products such as mushrooms, firewood, mosses and other floral greenery, and landscape vegetation * 360 valid water rights for surface water * vandalism, resource thefts, and garbage dumping * law enforcement monitoring * in-migration * rural and urban development in proportion to availability of land in urban growth boundaries and/or political pressure to incorporate existing forest or agricultural land into the urban growth boundaries * road maintenance including **1998 and 1999 storm damage repair** * storm events * enhancement of fish passage at 3 culverts on the Nestucca Access Road in accordance with the BLM's August 26, 1997 Decision Record * development and use of off-highway vehicle trails in accordance with the BLM's March 13, 1998 Decision Record.

Reasonably Foreseeable: * logging on private and state land with the assumption that much of the merchantable-aged timber will be harvested in accordance with the Oregon Forest Practices Act within the next ten years and the resultant clearcuts would then be managed (thinning, spraying herbicides, etc.) * increased road density on private industrial lands to support logging operations planned for the next several years * a no net-gain of road densities on federal lands * predicted flattening of in-migration * rural and urban development in proportion to availability of land in urban growth boundaries and/or political pressure to incorporate existing forest or agricultural land into the urban growth boundaries* recreational use including camping (including use of the four BLM-managed recreation sites - Alder Glen, Elk Bend, Fan Creek, and Dovre, and one United States Forest Service recreation site - Rocky Bend), hunting, fishing, target practicing, and sightseeing (including scenic driving along the Nestucca River National Back Country Byway) *development and implementation of water quality plan * increased road density proportional to residential development * use of the existing roads for accessing employment, recreation, and long distance driving in proportion to in-migration and tourism, as well as **timber hauling** * maintenance or improvements of existing roads including **Blaine Road Phase II, Meadow Lake Road and Nestucca Road East End Realignment*** logging and other silvicultural treatments on BLM and Forest Service land at current levels (approximately one timber sale per year) * no new mineral extraction, except gravel, due to the low quality and/or quantity of minerals * gathering of special forest products such as mosses, mushrooms, fire and landscaping vegetation at or above current levels * vandalism, resource thefts, and refuse dumping *continued law enforcement monitoring * storm events * **raising the water level of the McGuire Reservoir and associated actions** * control measures applied on exotic plants and noxious weeds along roadside and in regeneration areas * implementation of some stream enhancement projects by the BLM, private landowners, or others * wildlife habitat enhancement projects * **Coastal Road Stabilization and Watershed Restoration and Storm-Damage Road Repair.**

The details of those actions listed above in bold text follow:

- Developed recreation sites: The five developed recreation sites located along the Nestucca Access Road include Alder Glen, Elk Bend, Fan Creek, Dovre, and Rocky Bend. These sites provide a total of forty-two camping units and one shelter unit with associated restrooms. The use of these sites are at or near design capacity during weekend days from the July 4th weekend to Labor Day. Recreation use on mid-week days often approaches 30-50% of design capacity depending on weather. There are no current plans to increase the design capacity of these sites.
- Nestucca River National Back County Byway: The Nestucca River National Back County

Byway was originally dedicated in 1989 and expanded by the BLM in 1996. It traverses the Oregon Coast Range following "one of Oregon's most scenic rivers" and "offers the traveler a leisurely route through a typical coastal forest" with multiple land use "well demonstrated in farm, forest, recreation, fisheries, and wildlife management." (Administrative Record document 123 @ 906-911). There are no plans to amend the current road areas within the Nestucca River Back Country Byway.

- Blaine Road Project: The Blaine Road is a component of a 47-mile road between Beaver and Carlton, Oregon. The Blaine Road begins in Beaver, Oregon at the junction to State Highway 101 and travels easterly for approximately 14.5 miles until it joins with the BLM-managed Nestucca Access Road. The Blaine Road is classified by the County as a rural collector road. Several years ago the Federal Highway Administration, in agreement with Tillamook County, undertook to improve the road. The project was broken into two projects, Blaine Phase I and II.

  The Blaine Phase I project (Federal Highway Administration's Environmental Assessment, dated August 15, 1989) improved the existing road between MP (Mile Post) 10.8 to 14.1. The 3.3 miles were improved by mostly following the original alignment with some minor corrections, and widening the 20 foot driving surface to 22 feet.

  The environmental analysis for Phase II of the Blaine project (Supplemental Environmental Assessment, April 11,2000) is currently out for comment with a tentative implementation date of 2002. Work would be conducted between MP 6.7 to MP 10.8. The intent is to essentially maintain the same alignment over the entire road section and to not improve the road's current alignment standard except at 4 identified points. This project is anticipated to result in better driving quality and safety features. Foreseeable impacts due to the construction project would be a short-term increase in traffic during the duration of the contract, inconvenience to the public related to construction vehicles on the road, and possible traffic delays.

- 1996 storm damage road repairs (including those actions analyzed in BLM Environmental Assessment Number OR-086-96-02): The 1995/96 winter storms resulted in culverts being blocked with debris and portions of roads being washed out throughout the watershed on virtually all land ownerships. The road repairs were implemented to similar design standards to that which existed prior to the storm damage with no notable increase in road use due to the road repair activity. On federal land, the culverts that were replaced were designed to meet the requirements of a 100-year flood event to reduce the potential for road damage and associated sediment delivery from future storm events.

- Restoration of the Nestucca River and Bible Creek Access Roads (BLM Environmental Assessment Number OR-086-97-09): In accordance with the BLM's August 26, 1997 Decision Record, the following actions were implemented on the Nestucca Access Road

and the Bible Creek Access Road: road fills were stabilized, culverts replaced, asphalt pavement was patched, roads chip-sealed and the pavement was marked (paint fog lines and center line), large woody debris was placed within the Nestucca River flood plain/channel, and fish passage was improved at three sites.

- Restoration of the Bald Mountain Access Road (BLM Environmental Assessment Number OR-086-97-07): The Bald Mountain Access Road is a 14.6 mile road managed by the BLM. The road restoration included repairing road slumps, replacing failing culverts, and resurfacing (asphalt paving) the road. The road's current design standard was maintained. Replaced culverts were designed to meet the requirements of a 100 year-flood event to reduce the potential for road damage and associated sediment delivery from future storm events. There was no increase in traffic due to the road restoration project, with the exception of the construction traffic.

- Upper Nestucca motorcycle trail system (BLM Environmental Assessment Number OR-086-97-05): In accordance with the BLM's March 13, 1998 Decision Record, the BLM approved the development and use of an OHV (off-highway vehicle) trail system within the Nestucca and Willamina Creek Watersheds that totals 38 to 42 miles. Currently, there are approximately 28 miles of OHV trails. The highest use period of these trails is weekend days in June-August. OHV traffic counts during this period in 1998 was 192 users over 17 weekend days. Trail system use will continue to be monitored by the BLM and appropriate management actions will be taken if the use is determined to be adversely impacting natural resources. Any increase in use of this trail system will have a negligible impact on the average daily traffic counts associated with the Nestucca Access Road.

- 1998 and 1999 storm damage road repairs: Torrential rain in December of 1998 and 1999 resulted in damage on federal, state, and county roads in the Nestucca Watershed. Road damage included slumping, debris slides, and plugged culverts. Road work includes repairing road slumps, removal of debris slides with end-hauling the material to a suitable disposal site, unplugging culverts, and replacing culverts. Final storm damage assessments are pending.

- Timber hauling: It is anticipated that timber sales currently being planned by the BLM and City of McMinnville in the Willamina and Panther Creek Watersheds would utilize the Meadow Lake County Road as a timber haul route. (Note: the United States Forest Service and Oregon Department of Forestry do not anticipate utilizing the Nestucca Access Road for timber hauling for those projects currently planned).

- Meadow Lake Road: Yamhill County is planning to repair an unstable segment of the Meadow Lake Road as funding is available. The repair would be to the current road standard. The road primarily services the local residents and their support services. The

County does not anticipate an increase in vehicle use due to the proposed road maintenance, expect for a short-term increase due to construction traffic. Inconvenience to the public due is expected due to construction delays. A long-term increase in traffic on this road is anticipated generally proportional to population growth (2% annual increase).

- Nestucca Access Road East End Realignment: In accordance with the BLM's August 7, 1998 Decision Record, a 1,600 foot segment of the Nestucca Access Road, located in the Panther Creek Watershed, which has a chronic history of failure will be realigned to a stable location. The realigned route will be approximately 3,200 feet long. Work will be conducted by a contractor(s) working under the Federal Highway Administration. Work is anticipated to begin in 2001. The current design standard of the Nestucca Access Road will be maintained (e.g. two-lane asphalt road with a 22 foot driving surface, pavement marking, and design driving speed of 30 miles per hour). It is anticipated there will be a short-term increase in traffic on this road due to construction activities; however, the long-term use of the road is not predicted to increase due to the project itself. Additionally, there will be incremental disruption to public traffic. (BLM Environmental Assessment Number OR-086-98-03).

- McGuire Reservoir: This project entails among other things a proposal by the City of McMinnville to increase the capacity of the McGuire Reservoir by raising the height of the dam. Due to the associated inundation of a segment of the Nestucca Access Road, the proposal also includes the relocation of said road segment. The draft environmental assessment was issued February, 2000. The time frame is expected to be a two year seasonal window with most work done in the dry months, June 1 through November 1. The main road use is expected to be from the Willamette Valley to the project site. It is expected there would not be any more than 20 additional vehicles on the road at any one time. This would include 6 to 10 dump trucks working at one time; workers coming and leaving the site each day is estimated at 10 to 15 vehicles. However, the road use may increase when concrete is poured. The borrow site used will effect the amount of road use. In the event it is the Haskins Reservoir area, there would be an increase in overall road use between the two points. Alternate road realignment sites are also being explored. The realignment project would be compatible with any relocation determined for the McGuire Reservoir project. Associated road use increases would likely be from construction traffic. There may be some delays in public use traffic due to the construction.

- Coastal Road Stabilization and Watershed Restoration and Storm-Damage Road Repair: Road maintenance over the next 10 years is anticipated to be similar to current levels. In addition, BLM proposes to stabilize or decommission approximately 100 miles of BLM controlled roads over a five to ten year time period, beginning as early as 2001. The roads are within the Nestucca River, Trask River, Wilson River, and Kilchis River watersheds.

Storm-damaged BLM-controlled roads are identified at 10 locations within these watersheds. In addition to the 10 known sites, it is anticipated that more sites with damage to BLM-controlled roads will be discovered within these watersheds. The type and magnitude of repair work for these additional sites will be similar to that identified in the EA for the 10 known sites.

Appendix 4
Environmental Baseline on Relevant Indicators for the Oregon Coast Range Provence and Willamina Creek
Environmental Assessment Number OR-086-00-02

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Table 1: CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS FOR THE OREGON COAST RANGE PROVINCE

Administrative Unit: Salem District BLM

Basin/Section 7 Watershed: Nestucca -Bald Mountain Fork 6th Field Watershed

Project: Nestucca Fish Habitat Enhancement Project -Alternative 1 (No Action)

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS	Properly Functioning	At Risk	Not Properly Functioning	Restore	Maintain	Degrade
Water Quality: Temperature		X			X	
Turbidity		X			X	
Chem. Contam./Nut.	X				X	
Overall (303d reaches)			X		X	
Habitat Access: Physical Barriers			X		X	
Habitat Elements: Substrate/Sediment			X		X	
Large Woody Debris (LWD)			X		X[3]	X[3]
Pool Area %		X			X[3]	X[3]
Pool Quality	X				X[3]	X[3]
Pool Frequency	X				X[3]	X[3]
Off-Channel Habitat			X		X[3]	X[3]
Channel Cond. & Dyn.: Streambank Condition		X			X	
Floodplain Connectivity		X			X[3]	X[3]
Watershed Condition: Road Des. & Loc.			X		X	
Disturbance History		X			X[3]	X[3]
Stream Influence Zone		X			X[3]	X[3]
Refugia		X			X[3]	X[3]

X[1] - Potential short-term* adverse effects, with long term **maintenance** of indicator

X[2] - Potential short-term adverse effects, with long term **restoration** of indicator

X[3] - Possible degrade in the long-term as a result of no action.

X[4] - Short-term maintenance of the indicator, with long-term **restoration**

*Short term is considered to be the duration of the project, generally 1 year or less, but possibly intermittently up to 3 years.

Note: Effects are based on which way this project is likely to move the relevant indicator, but no change in baseline condition is expected.

Table 2: CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS FOR THE OREGON COAST RANGE PROVINCE

Administrative Unit: Salem District BLM

Basin/Section 7 Watershed: Nestucca -Bald Mountain Fork 6th Field Watershed

Project: Nestucca Fish Habitat Enhancement Project - Alternative 2

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS	Properly Functioning	At Risk	Not Properly Functioning	Restore	Maintain	Degrade
Water Quality: Temperature		X			X	
Turbidity		X			X[1]	X[1]
Chem. Contam./Nut.	X				X	
Overall (303d reaches)			X		X	
Habitat Access: Physical Barriers			X	X		
Habitat Elements: Substrate/Sediment			X	X		
Large Woody Debris (LWD)			X	X		
Pool Area %		X		X		
Pool Quality	X			X		
Pool Frequency	X			X		
Off-Channel Habitat			X	X		
Channel Cond. & Dyn.: Streambank Condition		X			X	
Floodplain Connectivity		X		X		
Watershed Condition: Road Des. & Loc.			X		X	
Disturbance History		X		X		
Stream Influence Zone		X		X		
Refugia		X		X		

X[1] - Potential short-term* adverse effects, with long term **maintenance** of indicator

X[2] - Potential short-term adverse effects, with long term **restoration** of indicator

X[3] - Possible degrade in the long-term as a result of no action.

X[4] - Short-term maintenance of the indicator, with long-term **restoration**

*Short term is considered to be the duration of the project, generally 1 year or less, but possibly intermittently up to 3 years.

Note: Effects are based on which way this project is likely to move the relevant indicator, but no change in baseline condition is

expected.

Table 3: CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS FOR THE OREGON COAST RANGE PROVINCE

Administrative Unit: Salem District BLM

Basin/Section 7 Watershed: Nestucca -Bald Mountain Fork 6th Field Watershed

Project: Nestucca Fish Habitat Enhancement Project - Alternative 3

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS	Properly Functioning	At Risk	Not Properly Functioning	Restore	Maintain	Degrade
Water Quality: Temperature		X			X	
Turbidity		X			X[1]	X[1]
Chem. Contam./Nut.	X				X	
Overall (303d reaches)			X		X	
Habitat Access: Physical Barriers			X		X	
Habitat Elements: Substrate/Sediment			X	X		
Large Woody Debris (LWD)			X	X		
Pool Area %		X		X		
Pool Quality	X			X		
Pool Frequency	X			X		
Off-Channel Habitat			X	X		
Channel Cond. & Dyn.: Streambank Condition		X			X	
Floodplain Connectivity		X		X		
Watershed Condition: Road Des. & Loc.			X		X	
Disturbance History		X		X		
Stream Influence Zone		X		X		
Refugia		X		X		

X[1] - Potential short-term* adverse effects, with long term **maintenance** of indicator

X[2] - Potential short-term adverse effects, with long term **restoration** of indicator

X[3] - Possible degrade in the long-term as a result of no action.

X[4] - Short-term maintenance of the indicator, with long-term **restoration**

*Short term is considered to be the duration of the project, generally 1 year or less, but possibly intermittently up to 3 years.

Note: Effects are based on which way this project is likely to move the relevant indicator, but no change in baseline condition is expected.

Supporting Data for Tables 1-3, Bald Mountain Fork 6th Field watershed

Analysis is based on data collected by BLM in 1992 and 1997. The Bald Mountain 6th field watershed contains mainstem Nestucca River as well as several tributaries. Projects proposed for this 6th field include the Ginger Creek culvert replacement (project 1) and the Bald Mountain/Ginger Creek mainstem Nestucca existing project maintenance and new enhancement (project 2).

Water Quality

Temperature: BLM stream temperature data collected in 1998 show that the Nestucca River within the Bald Mountain Fork 6th field watershed had a high 7-day maximum average water temperature of 67.3F. **At Risk.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Trees felled in the riparian area for instream use would be selected so there would be negligible, if any, reduction in canopy cover over the stream. Removal/disturbance of other vegetation in the riparian area would be limited by minimizing the number of access points through the riparian area, and disturbed areas will be planted or seeded with native vegetation (trees, shrubs, grasses, and/or forbs). **Maintain**.

Alternative 3: Trees felled in the riparian area for instream use would be selected so the would be minimal, if any, reduction in canopy cover over the stream. Removal/disturbance of other vegetation in the riparian area would be limited by minimizing the number of access points through the riparian area, and disturbed areas will be planted or seeded with native vegetation (trees, shrubs, grasses, and/or forbs).. **Maintain**.

Turbidity: The Bald Mountain Fork of the Nestucca River subwatershed has greater potential for debris slides and debris flow than the upper Nestucca River area (USFS and BLM 1994), though the frequency and magnitude of turbidity appear to be similar to other streams in the area. The Nestucca River from Powder Creek to the headwaters, which includes this 6th field watershed, is on the 303d list for sedimentation. This indicates that there may be turbidity occurring at higher frequency and duration relative to unimpacted streams within the basin. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: There would be some turbidity created through the placement of logs and rock in the stream channel and equipment operating within and adjacent to the stream channel. This turbidity would be short-term, and almost exclusively during the actual instream work. Replacement of the Ginger Creek culvert would also cause turbidity, both during instream work and most likely during the first high flow event following the culvert replacement. Turbidity and impacts on listed fish would be minimized by following ODFW guidelines for timing of in-water work, minimizing the time that heavy equipment is in the stream channel, minimizing the number of equipment access points through riparian areas, and planting or seeding disturbed sites prior to winter rains. Short term **Degrade**, long term **Maintain.**

Alternative 3: There would be some turbidity created through the placement of logs and rock in the stream channel and equipment operating adjacent to the stream channel. This turbidity would be short-term, and almost exclusively during the actual instream work. Turbidity and impacts on listed fish would be minimized by following ODFW guidelines for timing of in-water work, minimizing the number of equipment access points through riparian areas, and planting any disturbed sites prior to winter rains. Precluding equipment from operating within the stream channel may lessen, but would not eliminate turbidity. Not replacing the Ginger Creek culvert would also reduce the amount of turbidity occurring during project implementation. However, the Ginger Creek

culvert is undersized and has plugged in the past, therefore there is a potential that if the culvert will plug again and cause an increase in turbidity. Short term **Degrade**, long term **Maintain.**

Chemical Contamination/Nutrient Input: The is no evidence of chemical contamination or nutrient input within the 6th field watershed. **Properly Functioning.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: There is a possibility of chemical contamination (fuel/oil/hydraulic fluid spills) due to heavy equipment working in and adjacent to streams. To minimize the chance of spills equipment would be regularly checked for problems, such as leaks and broken hoses. To minimize impacts should a spill occur instream, containment booms would be placed downstream of equipment working in the stream channel. Any spill would be quickly contained and cleaned up, and would only impact a very small portion of the stream. There would be no *chronic* chemical contamination or nutrient input. **Maintain.**

Alternative 3: There is a possibility of chemical contamination (fuel/oil/hydraulic fluid spills) due to heavy equipment adjacent to streams. To minimize the chance of spills equipment would be regularly checked for problems, such as leaks and broken hoses. Any spill would be quickly contained and cleaned up, and would only impact a very small portion, if any, of the stream. There would be no *chronic* chemical contamination or nutrient input. **Maintain.**

Overall (303d reaches): The Nestucca River from Powder Creek to the headwaters, which included this 6th field watershed, is on the 303d list for sedimentation. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: There is a possibility of short term turbidity and sediment input into the stream channels through the placement of logs and rock in the stream channel and equipment operating within the stream channel. Turbidity and sediment input would be short-term, and almost exclusively during the actual instream work. Impacts to listed fish would be minimized by following ODFW guidelines for timing of in-water work, minimize time that heavy equipment is in the stream channel, minimizing the number of equipment access points through riparian areas, and planting or seeding any disturbed sites prior to winter rains. This project would not contribute to any additional 303d listings, or help remove this reach from the 303d list for sedimentation. **Maintain.**

Alternative 3: There is a possibility of short term turbidity and sediment input into the stream channels through the placement of logs and rock in the stream channel. Turbidity and sediment input would be short-term, and almost exclusively during the actual instream work. Impacts to listed fish would be minimized by following ODFW guidelines for timing of in-water work, minimize time that heavy equipment is in the stream channel, minimizing the number of equipment access points through riparian areas, and planting or seeding any disturbed sites prior to winter rains. This project would not contribute to any additional 303d listings, or help remove this reach from the 303d list for sedimentation. **Maintain.**

Habitat Access

Physical Barriers: Though no major barriers exist in this subwatershed, juvenile fish passage is known to be blocked at the Ginger Creek culvert at some flows. Fish passage is suspected to be blocked at other tributary culverts. In addition, upstream juvenile fish passage may be blocked during low streamflows at several log weirs placed during prior instream

work. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Part of the proposed action under alternative 2 would be to replace the Ginger Creek culvert to allow fish passage at all flows for all fish. Instream habitat enhancement work within this 6th field watershed would include maintenance and improvement of existing instream structures. Any existing structures that are found to be blocking fish passage would be modified to allow fish passage. **Restore**.

Alternative 3: Alternative 3 does not include the Ginger Creek culvert replacement. Alternative 3 does not allow equipment within the stream channel, therefore modification of all existing structures blocking fish passage may not be possible. **Maintain**.

Habitat Elements

Substrate/Sediment: The surveyed reaches of the Bald Mountain Fork 6th field watershed contain 33.6% silt and sand, and 36.8% gravel within low gradient riffles. **Not Properly Functioning.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Addition of large wood to the stream channel which is the primary sorting element in coastal streams would help sort substrate by creating slow water areas (pools, backwater and floodplain access) where fine particle naturally are deposited. The sorting function of large wood in riffle areas helps prevent fine particles from depositing in riffles and increases the percentage of gravels in riffles. **Restore.**

Alternative 3: Same as Alternative 2, except there would be less wood placed, therefore less beneficial effects. **Restore**.

Large Woody Debris: There are 6.4 key pieces of large woody debris per mile within the surveyed reaches of this 6th field watershed. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement and this indicator may **Degrade**.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. **Restore.**

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. **Restore.**

% Area in Pools: Pools make up 32% of the total surveyed area. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative, this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since pools are often

formed by large wood, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often creates pools, which should increase the amount of area in pools. **Restore.**

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often creates pools, which should increase the amount of area in pools. **Restore.**

Pool Quality: Pools greater than 1 meter deep make up 21% of the total surveyed area. **Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative, this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since pools, particularly quality pools, are often formed by large wood, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often forms deep pools, thus there should be an increase in the number of quality pools. Even though this indicator is considered properly functioning, additional quality pools with the added complexity supplied by large wood will further improve habitat. **Restore.**

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often forms deep pools, thus there should be an increase in the number of quality pools. Even though this indicator is considered properly functioning, additional quality pools with the added complexity supplied by large wood will further improve habitat. **Restore.**

Pool Frequency: There are 6.1 channel widths between pools. **Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since pools are often formed by large wood, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often creates pools, which would increase the pool frequency. Even though this indicator is considered properly functioning, additional pools would further improve habitat. **Restore.**

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often creates pools, which would increase the pool frequency. Even though this indicator is considered properly functioning, additional pools would further improve habitat. **Restore.**

Off Channel Habitat: Off-channel habitat makes up only 2% of the area within the surveyed portion of the watershed. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since pools are often

formed by large wood, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood improves connections between the stream channel and the floodplain, and creates off-channel habitat. **Restore**.

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood improves connections between the stream channel and the floodplain, and creates off-channel habitat. **Restore**.

Channel Conditions

Streambank Condition: Survey data show 20% of streambank actively eroding. **At Risk.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Heavy equipment adjacent to and entering the stream channel may disturb streambanks. Replacing the culvert at Ginger Creek would cause bank disturbance. However, impacts would be minimized by following ODFW guidelines for timing of in-water work when flows are low and potential for erosion is negligible, minimizing the number of equipment access points through riparian areas and along streambanks, and planting or seeding any disturbed sites prior to winter rains. The amount of actively eroding streambank is not expected to increase. **Maintain**.

Alternative 3: No bank disturbance would occur at the Ginger Creek culvert site. Heavy equipment adjacent to the stream channel may disturb streambanks. However, impacts would be minimized by following ODFW guidelines for timing of in-water work when flows are low and potential for erosion is negligible, minimizing the number of equipment access points through riparian areas and along streambanks, and planting or seeding any disturbed sites prior to winter rains. Keeping equipment out of the stream channel may cause more bank disturbance than in Alternative 2, however, the amount of actively eroding streambank is not expected to increase. **Maintain**.

Floodplain Connectivity: A good component of large wood and the presence of secondary channels, connections between Bald Mountain Fork of the Nestucca and its floodplain are considered to be within the Properly Functioning range. However the total off-channel habitat in the 6th field watershed, which includes a portion of the mainstem Nestucca, is only 2%. Past floods and the presence of the Nestucca Access Road has limited the floodplain connections. **At Risk.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since large wood is an important part of maintaining floodplain connections, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood improves connections between the stream channel and the floodplain, and creates off-channel habitat. **Restore**.

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood improves connections between the stream channel and the floodplain, and creates off-channel habitat.

Restore.

Watershed Conditions

Road Density and Location: Road densities are 4.04 miles per square mile in the Bald Mountain Fork of the Nestucca subwatershed.(USFS and BLM 1994). In addition there are valley bottom roads within this 6th field watershed, specifically the Nestucca Access Road. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Since no roads would be built or decommissioned, this indicator would be **Maintained.**

Alternative 3: Since no roads would be built or decommissioned, this indicator would be **Maintained.**

Disturbance History: Due to past timber harvest, floods, fire, and road building, portions of the watershed have been impacted and fragmented (USFS and BLM 1994). **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, some riparian areas within the Nestucca watershed lack conifers for future input of large wood and shading of the stream channel. As current large wood in the stream channel decomposes, and alders growing along the banks grow old there may be lack of shade and little replacement of large wood instream. This indicator may **Degrade** in the long term.

Alternative 2: Addition of large wood to the streams and the floodplains will help supply some of the large wood that the riparian areas currently cannot. Planting native vegetation in the riparian areas will help maintain and restore shading and future input of large wood to the stream channel. **Restore**.

Alternative 3: Addition of large wood to the streams and the floodplains will help supply some of the large wood that the riparian areas currently cannot. Planting native vegetation in the riparian areas will help maintain and restore shading and future input of large wood to the stream channel. **Restore**.

Stream Influence Zone: Due to past timber harvest, floods, fire, and road building, stream influence zones have been somewhat altered and are not providing adequate large wood at this time (USFS and BLM 1994). **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, some riparian areas within the Nestucca watershed lack conifers for future input of large wood and shading of the stream channel. As current large wood in the stream channel decomposes, and alders growing along the banks grow old there may be lack of shade and little replacement of large wood instream. This indicator may **Degrade** in the long term.

Alternative 2: Addition of large wood to the streams and the floodplains will help supply some of the large wood that the riparian areas currently cannot. Planting native vegetation in the riparian areas will help maintain and restore shading and future input of large wood to the stream channel. **Restore**.

Alternative 3: Addition of large wood to the streams and the floodplains will help supply some of the large wood

that the riparian areas currently cannot. Planting native vegetation in the riparian areas will help maintain and restore shading and future input of large wood to the stream channel. **Restore**.

Refugia: Due to past floods, management actions and a higher potential for debris slides, this subwatershed is deficient in large wood, is lacking off-channel habitat and has a channel that has been scoured to bedrock in some areas. Though there is some habitat refugia for fish populations, this indicator is considered at risk. **At Risk.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, as current large wood in the stream channel decomposes adequate replacement may not occur, causing a **Degrade** of refugia in the long term.

Alternative 2: Addition of large wood to the stream channel and floodplain and planting native vegetation in the riparian areas will help maintain and **Restore** refugia within the watershed.

Alternative 3: Addition of large wood to the stream channel and floodplain and planting native vegetation in the riparian areas will help maintain and **Restore** refugia within the watershed.

Table 4: CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS FOR THE OREGON COAST RANGE PROVINCE

Administrative Unit: Salem District BLM Basin/Section 7 Watershed: Nestucca - Fan Creek 6th Field Watershed
Project:Nestucca Fish Habitat Enhancement Project - Alternative 1 (No Action)

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS	Properly Functioning	At Risk[1]	Not Proper. Functioning	Restore	Maintain	Degrade
Water Quality: Temperature		X			X	
Turbidity		X			X	
Chem. Contam./Nut.	X				X	
Overall (303d reaches)			X		X	
Habitat Access: Physical Barriers			X		X	
Habitat Elements: Substrate/Sediment		X			X	
Large Woody Debris (LWD)			X		X[3]	X[3]
Pool Area %	X				X[3]	X[3]
Pool Quality	X				X[3]	X[3]
Pool Frequency	X				X[3]	X[3]
Off-Channel Habitat			X		X[3]	X[3]
Channel Cond. & Dyn.: Streambank Condition		X			X	
Floodplain Connectivity			X		X[3]	X[3]
Watershed Condition: Road Des. & Loc.			X		X	
Disturbance History		X			X[3]	X[3]
Stream Influence Zone		X			X[3]	X[3]
Refugia		X			X[3]	X[3]

X[1] - Potential short-term* adverse effects, with long term maintenance of indicator
X[2] - Potential short-term adverse effects, with long term restoration of indicator

X[3] - Possible degrade in the long-term as a result of no action.
X[4] - Short-term maintenance of the indicator, with long-term restoration
*Short term is considered to be the duration of the project, generally 1 year or less, but possibly intermittently up to 3 years.
Note: Effects are based on which way this project is likely to move the relevant indicator, but no change in baseline condition is expected.

Table 5: CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS FOR THE OREGON COAST RANGE PROVINCE

Administrative Unit: Salem District BLM Basin/Section 7 Watershed: Nestucca - Fan Creek 6th Field Watershed
Project: Nestucca Fish Habitat Enhancement Project - Alternative 2

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS	Properly Functioning	At Risk[1]	Not Proper. Functioning	Restore[2]	Maintain[3]	Degrade[4]
Water Quality: Temperature		X			X	
Turbidity		X			X[1]	X[1]
Chem. Contam./Nut.	X				X	
Overall (303d reaches)			X		X	
Habitat Access: Physical Barriers			X	X		
Habitat Elements: Substrate/Sediment		X		X		
Large Woody Debris (LWD)			X	X		
Pool Area %	X			X		
Pool Quality	X			X		
Pool Frequency	X			X		
Off-Channel Habitat			X	X		
Channel Cond. & Dyn.: Streambank Condition		X			X	
Floodplain Connectivity			X	X		
Watershed Condition: Road Des. & Loc.			X		X	
Disturbance History		X		X		
Stream Influence Zone		X		X		
Refugia		X		X		

X[1] - Potential short-term* adverse effects, with long term maintenance of indicator
X[2] - Potential short-term adverse effects, with long term restoration of indicator
X[3] - Possible degrade in the long-term as a result of no action.
X[4] - Short-term maintenance of the indicator, with long-term restoration

*Short term is considered to be the duration of the project, generally 1 year or less, but possibly intermittently up to 3 years.
Note: Effects are based on which way this project is likely to move the relevant indicator, but no change in baseline condition is expected.

Table 6: CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS FOR THE OREGON COAST RANGE PROVINCE

Administrative Unit: Salem District BLM Basin/Section 7 Watershed: Nestucca - Fan Creek 6th Field Watershed
Project: Nestucca Fish Habitat Enhancement Project - Alternative 3

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS	Properly Functioning	At Risk[1]	Not Proper. Functioning	Restore[2]	Maintain[3]	Degrade[4]
Water Quality: Temperature		X			X	
Turbidity		X			X[1]	X[1]
Chem. Contam./Nut.	X				X	
Overall (303d reaches)			X		X	
Habitat Access: Physical Barriers			X		X	
Habitat Elements: Substrate/Sediment		X		X		
Large Woody Debris (LWD)			X	X		
Pool Area %	X			X		
Pool Quality	X			X		
Pool Frequency	X			X		
Off-Channel Habitat			X	X		
Channel Cond. & Dyn.: Streambank Condition		X			X	
Floodplain Connectivity			X	X		
Watershed Condition: Road Des. & Loc.			X		X	
Disturbance History		X		X		
Stream Influence Zone		X		X		
Refugia		X		X		

X[1] - Potential short-term* adverse effects, with long term maintenance of indicator
X[2] - Potential short-term adverse effects, with long term restoration of indicator
X[3] - Possible degrade in the long-term as a result of no action.

X^4 - Short-term maintenance of the indicator, with long-term restoration
*Short term is considered to be the duration of the project, generally 1 year or less, but possibly intermittently up to 3 years.
Note: Effects are based on which way this project is likely to move the relevant indicator, but no change in baseline condition is expected.

Supporting Rationale for Tables 4-6: Fan Creek matrix indicators.
Analysis is based on data collected by ODFW in 1997. The Fan Creek 6th field watershed contains mainstem Nestucca River as well as several tributaries. The project proposed for this 6th field is the Cabinet Creek to Fan Creek mainstem Nestucca enhancement (project 4).

Water Quality

Temperature: BLM stream temperature data collected in 1998 show that the Nestucca River within the Fan Creek 6th field watershed had a high 7-day maximum average water temperature of 64.4F. **At Risk.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Trees felled in the riparian area for instream use would be selected so there would be negligible, if any, reduction in canopy cover over the stream. Removal/disturbance of other vegetation in the riparian area would be limited by minimizing the number of access points through the riparian area, and disturbed areas will be planted or seeded with native vegetation (trees, shrubs, grasses, and/or forbs). **Maintain**.

Alternative 3: Trees felled in the riparian area for instream use would be selected so the would be minimal, if any, reduction in canopy cover over the stream. Removal/disturbance of other vegetation in the riparian area would be limited by minimizing the number of access points through the riparian area, and disturbed areas will be planted or seeded with native vegetation (trees, shrubs, grasses, and/or forbs).. **Maintain**.

Turbidity: The Nestucca River from Powder Creek to the headwaters, which includes this 6th field watershed, is on the 303d list for sedimentation. This indicates that there may be turbidity occurring at higher frequency and duration relative to unimpacted streams within the basin. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: There would be some turbidity created through the placement of logs and rock in the stream channel and equipment operating within and adjacent to the stream channel. This turbidity would be short-term, and almost exclusively during the actual instream work. Turbidity and impacts on listed fish would be minimized by following ODFW guidelines for timing of in-water work, minimizing the time that heavy equipment is in the stream channel, minimizing the number of equipment access points through riparian areas, and planting or seeding disturbed sites prior to winter rains. Short term **Degrade**, long term **Maintain.**

Alternative 3: There would be some turbidity created through the placement of logs and rock in the stream channel and equipment operating adjacent to the stream channel. This turbidity would be short-term, and almost exclusively during the actual instream work. Turbidity and impacts on listed fish would be minimized by following ODFW guidelines for timing of in-water work, minimizing the number of equipment access points

through riparian areas, and planting any disturbed sites prior to winter rains. Precluding equipment from operating within the stream channel may lessen, but would not eliminate turbidity. Short term **Degrade**, long term **Maintain.**

Chemical Contamination/Nutrient Input: The is no evidence of chemical contamination or nutrient input within the 6th field watershed. **Properly Functioning.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: There is a possibility of chemical contamination (fuel/oil/hydraulic fluid spills) due to heavy equipment working in and adjacent to streams. To minimize the chance of spills equipment would be regularly checked for problems, such as leaks and broken hoses. To minimize impacts should a spill occur instream, containment booms would be placed downstream of equipment working in the stream channel. Any spill would be quickly contained and cleaned up, and would only impact a very small portion of the stream. There would be no *chronic* chemical contamination or nutrient input. **Maintain.**

Alternative 3: There is a possibility of chemical contamination (fuel/oil/hydraulic fluid spills) due to heavy equipment adjacent to streams. To minimize the chance of spills equipment would be regularly checked for problems, such as leaks and broken hoses. Any spill would be quickly contained and cleaned up, and would only impact a very small portion, if any, of the stream. There would be no *chronic* chemical contamination or nutrient input. **Maintain.**

Overall (303d reaches): The Nestucca River from Powder Creek to the headwaters, which included this 6th field watershed, is on the 303d list for sedimentation. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: There is a possibility of short term turbidity and sediment input into the stream channels through the placement of logs and rock in the stream channel and equipment operating within the stream channel. Turbidity and sediment input would be short-term, and almost exclusively during the actual instream work. Impacts to listed fish would be minimized by following ODFW guidelines for timing of in-water work, minimize time that heavy equipment is in the stream channel, minimizing the number of equipment access points through riparian areas, and planting or seeding any disturbed sites prior to winter rains. This project would not contribute to any additional 303d listings, or help remove this reach from the 303d list for sedimentation. **Maintain.**

Alternative 3: There is a possibility of short term turbidity and sediment input into the stream channels through the placement of logs and rock in the stream channel. Turbidity and sediment input would be short-term, and almost exclusively during the actual instream work. Impacts to listed fish would be minimized by following ODFW guidelines for timing of in-water work, minimize time that heavy equipment is in the stream channel, minimizing the number of equipment access points through riparian areas, and planting or seeding any disturbed sites prior to winter rains. This project would not contribute to any additional 303d listings, or help remove this reach from the 303d list for sedimentation. **Maintain.**

Habitat Access

Physical Barriers: Though no major barriers exist in this subwatershed, several tributaries have culverts suspected of blocking fish passage at some flows. In addition, upstream juvenile fish passage may be blocked during low streamflows at several log weirs placed during prior instream work. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Instream habitat enhancement work within this 6th field watershed would include maintenance and improvement of existing instream structures. Any existing structures that are found to be blocking fish passage would be modified to allow fish passage. **Restore**.
Alternative 3: Alternative 3 does not include the Ginger Creek culvert replacement. Alternative 3 does not allow equipment within the stream channel, therefore modification of all existing structures blocking fish passage may not be possible. **Maintain**.

Habitat Elements

Substrate/Sediment: Silt and sand make up 10.9% of the substrate and gravel makes up 53.6 % of the substrate. **At Risk.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Addition of large wood to the stream channel which is the primary sorting element in coastal streams would help sort substrate by creating slow water areas (pools, backwater and floodplain access) where fine particle naturally are deposited. The sorting function of large wood in riffle areas helps prevent fine particles from depositing in riffles and increases the percentage of gravels in riffles. **Restore.**

Alternative 3: Same as Alternative 2, except there would be less wood placed, therefore less beneficial effects. **Restore**.

Large Woody Debris: There are 5 key pieces of large woody debris per mile within the surveyed reaches of this 6th field watershed. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement and this indicator may **Degrade**.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. **Restore.**

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. **Restore.**

% Area in Pools: Pools make up 55% of the total surveyed area. **Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative, this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since pools are often formed by large wood, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often creates pools, which should increase the amount of area in pools. **Restore.**

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often creates pools, which should increase the amount of area in pools. **Restore.**

Pool Quality: Pools greater than 1 meter deep make up 35% of the total surveyed area. **Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative, this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since pools, particularly quality pools, are often formed by large wood, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often forms deep pools, thus there should be an increase in the number of quality pools. Even though this indicator is considered properly functioning, additional quality pools with the added complexity supplied by large wood will further improve habitat. **Restore.**

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often forms deep pools, thus there should be an increase in the number of quality pools. Even though this indicator is considered properly functioning, additional quality pools with the added complexity supplied by large wood will further improve habitat. **Restore.**

Pool Frequency: There are 1.3 channel widths between pools. **Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since pools are often formed by large wood, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often creates pools, which would increase the pool frequency. Even though this indicator is considered properly functioning, additional pools will further improve habitat. **Restore.**

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often creates pools, which would increase the pool frequency. Even though this indicator is considered properly functioning, additional pools will further improve habitat. **Restore.**

Off Channel Habitat: Off-channel habitat makes up only 1.5% of the area within the surveyed portion of the watershed. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since pools are often formed by large wood, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood improves connections between the stream channel and the floodplain, and creates off-channel habitat. **Restore**.

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood improves connections between the stream channel and the floodplain, and creates off-channel habitat. **Restore**.

Channel Conditions

Streambank Condition: Survey data show 20% of streambank actively eroding. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Heavy equipment adjacent to and entering the stream channel may disturb streambanks. However, impacts would be minimized by following ODFW guidelines for timing of in-water work when flows are low and potential for erosion is negligible, minimizing the number of equipment access points through riparian areas and along streambanks, and planting or seeding any disturbed sites prior to winter rains. The amount of actively eroding streambank is not expected to increase. **Maintain**.

Alternative 3: Heavy equipment adjacent to the stream channel may disturb streambanks. However, impacts would be minimized by following ODFW guidelines for timing of in-water work when flows are low and potential for erosion is negligible, minimizing the number of equipment access points through riparian areas and along streambanks, and planting or seeding any disturbed sites prior to winter rains. Keeping equipment out of the stream channel may cause more bank disturbance than in Alternative 2, however, the amount of actively eroding streambank is not expected to increase. **Maintain**.

Floodplain Connectivity: Lack of large wood and presence of roads, particularly the Nestucca Access Road, has limited or eliminated floodplain connections. Only 1.5% of the surveyed reaches is off-channel habitat, indicating a lack of floodplain connectivity. **Not Properly Functioning.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since large wood is an important part of maintaining floodplain connections, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood improves connections between the stream channel and the floodplain, and creates off-channel habitat. **Restore**.

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood improves connections between the stream channel and the floodplain, and creates off-channel habitat. **Restore**.

Watershed Conditions

Road Density and Location: Road densities are high in the Nestucca watershed, and some roads are valley bottom roads, including the Nestucca Access Road (USFS and BLM 1994). **Not Properly Functioning.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Since no roads would be built or decommissioned, this indicator would be **Maintained.**

Alternative 3: Since no roads would be built or decommissioned, this indicator would be **Maintained.**

Disturbance History: Due to past timber harvest, floods, fire, and road building, portions of the riparian areas are not providing adequate large wood at this time (USFS and BLM 1994). **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, some riparian areas within the Nestucca watershed lack conifers for future input of large wood and shading of the stream channel. As current large wood in the stream channel decomposes, and alders growing along the banks grow old there may be lack of shade and little replacement of large wood instream. This indicator may **Degrade** in the long term.

Alternative 2: Addition of large wood to the streams and the floodplains will help supply some of the large wood that the riparian areas currently cannot. Planting native vegetation in the riparian areas will help maintain and restore shading and future input of large wood to the stream channel. **Restore**.

Alternative 3: Addition of large wood to the streams and the floodplains will help supply some of the large wood that the riparian areas currently cannot. Planting native vegetation in the riparian areas will help maintain and restore shading and future input of large wood to the stream channel. **Restore**.

Stream Influence Zone: Due to past timber harvest, floods, fire, and road building, stream influence zones have been somewhat altered (USFS and BLM 1994). **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, some riparian areas within the Nestucca watershed lack conifers for future input of large wood and shading of the stream channel. As current large wood in the stream channel decomposes, and alders growing along the banks grow old there may be lack of shade and little replacement of large wood instream. This indicator may **Degrade** in the long term.

Alternative 2: Addition of large wood to the streams and the floodplains will help supply some of the large wood that the riparian areas currently cannot. Planting native vegetation in the riparian areas will help maintain and restore shading and future input of large wood to the stream channel. **Restore**.

Alternative 3: Addition of large wood to the streams and the floodplains will help supply some of the large wood that the riparian areas currently cannot. Planting native vegetation in the riparian areas will help maintain and restore shading and future input of large wood to the stream channel. **Restore**.

Refugia: Due to past floods, management actions and other habitat problems that include a channel that has been scoured to bedrock in some areas, this indicator is considered at risk. **At Risk.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, as current large wood in the stream channel decomposes adequate replacement may not occur, causing a **Degrade** of refugia in the long term.

Alternative 2: Addition of large wood to the stream channel and floodplain and planting native vegetation in the riparian areas will help maintain and **Restore** refugia within the watershed.

Alternative 3: Addition of large wood to the stream channel and floodplain and planting native vegetation in the riparian areas will help maintain and **Restore** refugia within the watershed.

Table 7: CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS FOR THE OREGON COAST RANGE PROVINCE

Administrative Unit: Salem District BLM Basin/Section 7 Watershed: Nestucca - Elk Creek 6th Field

Project: Nestucca Fish Habitat Enhancement Project - Alternative 1 (No Action)

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS	Properly Functioning	At Risk[1]	Not Proper. Functioning	Restore[2]	Maintain[3]	Degrade[4]
Water Quality: Temperature			X		X	
Turbidity		X			X	
Chem. Contam./Nut.	X				X	
Overall (303d reaches)	X				X	
Habitat Access: Physical Barriers			X		X	
Habitat Elements: Substrate/Sediment		X			X	
Large Woody Debris (LWD)			X		X[3]	X[3]
Pool Area %		X			X[3]	X[3]
Pool Quality	X				X[3]	X[3]
Pool Frequency	X				X[3]	X[3]
Off-Channel Habitat			X		X[3]	X[3]
Channel Cond. & Dyn.: Streambank Condition			X		X	
Floodplain Connectivity			X		X[3]	X[3]
Watershed Condition: Road Des. & Loc.			X		X	

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS						
Disturbance History		X			X^3	X^3
Stream Influence Zone		X			X^3	X^3
Refugia		X			X^3	X^3

X^1 - Potential short-term* adverse effects, with long term maintenance of indicator
X^2 - Potential short-term adverse effects, with long term restoration of indicator
X^3 - Possible degrade in the long-term as a result of no action.
X^4 - Short-term maintenance of the indicator, with long-term restoration
*Short term is considered to be the duration of the project, generally 1 year or less, but possibly intermittently up to 3 years.
Note: Effects are based on which way this project is likely to move the relevant indicator, but no change in baseline condition is expected.

Table 8: CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS FOR THE OREGON COAST RANGE PROVINCE

Administrative Unit: Salem District BLM Basin/Section 7 Watershed: Nestucca - Elk Creek 6th Field

Project: Nestucca Fish Habitat Enhancement Project - Alternative 2

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS	Properly Functioning	At Risk[1]	Not Proper. Functioning	Restore[2]	Maintain[3]	Degrade[4]
Water Quality: Temperature			X		X	
Turbidity		X			X^1	X^1
Chem. Contam./Nut.	X				X	
Overall (303d reaches)	X				X	
Habitat Access: Physical Barriers			X	X		
Habitat Elements: Substrate/Sediment		X		X		
Large Woody Debris (LWD)			X	X		
Pool Area %		X		X		
Pool Quality	X			X		
Pool Frequency	X			X		
Off-Channel Habitat			X	X		
Channel Cond. & Dyn.: Streambank Condition			X		X	

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS						
Hydrology: Connectivity			X	X		
Watershed Condition: Road Des. & Loc.			X		X	
Disturbance History		X		X		
Stream Influence Zone		X		X		
Refugia		X		X		

X[1] - Potential short-term* adverse effects, with long term maintenance of indicator
X[2] - Potential short-term adverse effects, with long term restoration of indicator
X[3] - Possible degrade in the long-term as a result of no action.
X[4] - Short-term maintenance of the indicator, with long-term restoration
*Short term is considered to be the duration of the project, generally 1 year or less, but possibly intermittently up to 3 years.
Note: Effects are based on which way this project is likely to move the relevant indicator, but no change in baseline condition is expected.

Table 9: CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS FOR THE OREGON COAST RANGE PROVINCE

Administrative Unit: Salem District BLM Basin/Section 7 Watershed: Nestucca - Elk Creek 6th Field

Project: Nestucca Fish Habitat Enhancement Project - Alternative 3

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS	Properly Functioning	At Risk[1]	Not Proper. Functioning	Restore[2]	Maintain[3]	Degrade[4]
Water Quality: Temperature			X		X	
Turbidity		X			X[1]	X[1]
Chem. Contam./Nut.	X				X	
Overall (303d reaches)	X				X	
Habitat Access: Physical Barriers			X		X	
Habitat Elements: Substrate/Sediment		X		X		
Large Woody Debris (LWD)			X	X		
Pool Area %		X		X		
Pool Quality	X			X		
Pool Frequency	X			X		

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS	Properly Functioning	At Risk	Not Properly Functioning	Properly Functioning	At Risk	Not Properly Functioning
Habitat Elements:						
Channel Cond. & Dyn.: Streambank Condition			X		X	
Floodplain Connectivity			X	X		
Watershed Condition: Road Des. & Loc.			X		X	
Disturbance History		X		X		
Stream Influence Zone		X		X		
Refugia		X		X		

X[1] - Potential short-term* adverse effects, with long term maintenance of indicator
X[2] - Potential short-term adverse effects, with long term restoration of indicator
X[3] - Possible degrade in the long-term as a result of no action.
X[4] - Short-term maintenance of the indicator, with long-term restoration
*Short term is considered to be the duration of the project, generally 1 year or less, but possibly intermittently up to 3 years.
Note: Effects are based on which way this project is likely to move the relevant indicator, but no change in baseline condition is expected.

Supporting Rationale for Tables 7-9: Elk Creek matrix indicators.
Analysis based on data collected by ODFW in 1996 and 1997. The Elk Creek 6th field watershed contains Elk Creek and its tributaries only. The project proposed for this 6th field is part of project 6, maintenance and addition to existing structures.

Water Quality

Temperature: Twenty years of water temperature data from the Beaver gauge on the mainstem Nestucca indicates that temperatures (7 day average maximum) exceeded 68°F during the peak water temperature period in each year. BLM data establish that Elk Creek has exceeded the (7 day average maximum) of 68°F during low flow and high ambient temperature periods. The high probability that water temperatures will exceed 68°F in any year would make this baseline indicator **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: No trees would be felled in riparian areas for instream use so there would be no reduction in canopy cover over the stream. Removal/disturbance of other vegetation in the riparian area would be limited by minimizing the number of access points through the riparian area, and disturbed areas will be planted or seeded with native vegetation (trees, shrubs, grasses, and/or forbs). **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

Turbidity: Elk Creek drainage has gravel-surfaced and natural surfaced roads, portions of which are located in the riparian zone and impinge on Elk Creek. These road systems contribute to turbidity during wet weather. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: There would be some turbidity created through the placement of logs and rock in the stream channel and equipment operating within and adjacent to the stream channel. This turbidity would be short-term, and almost exclusively during the actual instream work. Turbidity and impacts on listed fish would be minimized by following ODFW guidelines for timing of in-water work, minimizing the time that heavy equipment is in the stream channel, minimizing the number of equipment access points through riparian areas, and planting or seeding disturbed sites prior to winter rains. Short term **Degrade**, long term **Maintain.**

Alternative 3: There would be some turbidity created through the placement of logs and rock in the stream channel and equipment operating adjacent to the stream channel. This turbidity would be short-term, and almost exclusively during the actual instream work. Turbidity and impacts on listed fish would be minimized by following ODFW guidelines for timing of in-water work, minimizing the number of equipment access points through riparian areas, and planting any disturbed sites prior to winter rains. Precluding equipment from operating within the stream channel may lessen, but would not eliminate turbidity. Short term **Degrade**, long term **Maintain.**

Chemical Contamination/Nutrient Input: The is no evidence of chemical contamination or nutrient input within the 6th field watershed. **Properly Functioning.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: There is a possibility of chemical contamination (fuel/oil/hydraulic fluid spills) due to heavy equipment working in and adjacent to streams. To minimize the chance of spills equipment would be regularly checked for problems, such as leaks and broken hoses. Any spill would be quickly contained and cleaned up, and would only impact a very small portion, if any, of the stream. There would be no *chronic* chemical contamination or nutrient input. **Maintain.**

Alternative 3: There is a possibility of chemical contamination (fuel/oil/hydraulic fluid spills) due to heavy equipment adjacent to streams. To minimize the chance of spills equipment would be regularly checked for problems, such as leaks and broken hoses. To minimize impacts should a spill occur instream, containment booms would be placed downstream of equipment working in the stream channel. Any spill would be quickly contained and cleaned up, and would only impact a very small portion of the stream. There would be no *chronic* chemical contamination or nutrient input. **Maintain.**

Overall (303d reaches): Elk Creek is not on the DEQ 303d list, therefore this indicator is **Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: There is a possibility of short term turbidity and sediment input into the stream channels through the placement of logs and rock in the stream channel and equipment operating within the stream channel. Turbidity and sediment input would be short-term, and almost exclusively during the actual instream work. Impacts to listed fish would be minimized by following ODFW guidelines for timing of in-water work, minimize time that heavy equipment is in the stream channel, minimizing the number of equipment access points through riparian areas, and planting or seeding any disturbed sites prior to winter rains. This project would not contribute to any additional 303d listings, or help remove this reach from the 303d list for sedimentation. **Maintain.**

Alternative 3: There is a possibility of short term turbidity and sediment input into the stream channels through the placement of logs and rock in the stream channel. Turbidity and sediment input would be short-term, and

almost exclusively during the actual instream work. Impacts to listed fish would be minimized by following ODFW guidelines for timing of in-water work, minimize time that heavy equipment is in the stream channel, minimizing the number of equipment access points through riparian areas, and planting or seeding any disturbed sites prior to winter rains. This project would not contribute to any additional 303d listings, or help remove this reach from the 303d list for sedimentation. **Maintain.**

Habitat Access

Physical Barriers: Though no major barriers exist in this subwatershed, several tributaries have culverts suspected of blocking fish passage at some flows. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Instream habitat enhancement work within this 6th field watershed would include maintenance and improvement of existing instream structures. Any existing structures that are found to be blocking fish passage would be modified to allow fish passage. **Restore**.

Alternative 3: Alternative 3 does not include the Ginger Creek culvert replacement. Alternative 3 does not allow equipment within the stream channel, therefore modification of all existing structures blocking fish passage may not be possible. **Maintain**.

Habitat Elements

Substrate/Sediment: Data exists on substrate conditions in Elk Creek from surveys conducted during 1996. Available data for reaches below the falls indicate the substrate is dominated by gravel, cobble, small boulder and organic material. The combined percentage of sand and organic material in riffles is 17%, while riffles and riffles with pockets combined have 14% sand and organic material. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Addition of large wood to the stream channel which is the primary sorting element in coastal streams would help sort substrate by creating slow water areas (pools, backwater and floodplain access) where fine particle naturally are deposited. The sorting function of large wood in riffle areas helps prevent fine particles from depositing in riffles and increases the percentage of gravels in riffles. **Restore.**

Alternative 3: Same as Alternative 2, except there would be less wood placed, therefore less beneficial effects. **Restore**.

Large Woody Debris: Due to past floods and management actions, Elk Creek is deficient in large woody debris (USFS and BLM 1994). The 3.45 miles of main channel and side channel habitat that have been enhanced through stream improvement projects contain 61 pieces of large wood which approach or exceed the standard of 24 in. diameter and 50 ft. long. The total stream distance including side channels has about 18 pieces of large wood per mile. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement and this indicator may

Degrade.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. **Restore.**

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. **Restore.**

% Area in Pools: Pools make up 40.5% of the total surveyed area. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative, this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since pools are often formed by large wood, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often creates pools, which should increase the amount of area in pools. **Restore.**

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often creates pools, which should increase the amount of area in pools. **Restore.**

Pool Quality: Pools greater than 1 meter deep make up 23% of the total surveyed area. **Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative, this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since pools, particularly quality pools, are often formed by large wood, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often forms deep pools, thus there should be an increase in the number of quality pools. Even though this indicator is considered properly functioning, additional quality pools with the added complexity supplied by large wood will further improve habitat. **Restore.**

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often forms deep pools, thus there should be an increase in the number of quality pools. Even though this indicator is considered properly functioning, additional quality pools with the added complexity supplied by large wood will further improve habitat. **Restore.**

Pool Frequency: There are 4 channel widths between pools. **Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since pools are often formed by large wood, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often creates pools, which would increase the pool frequency. Even though this indicator is considered properly functioning, additional pools will further improve habitat. **Restore.**

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often creates pools, which would increase the pool frequency. Even though this indicator is considered properly functioning, additional pools will further improve habitat. **Restore.**

Off Channel Habitat: Off-channel habitat makes up only 5% of the area within the surveyed portion of the watershed. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since pools are often formed by large wood, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood improves connections between the stream channel and the floodplain, and creates off-channel habitat. **Restore**.

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood improves connections between the stream channel and the floodplain, and creates off-channel habitat. **Restore**.

Channel Conditions

Streambank Condition: Based on stream inventory data, 77% of streambanks are actively eroding. Though this data was collected soon after the flood of 1996 and is likely high for that reason, streambank condition is rated as **Not Properly Functioning.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Heavy equipment adjacent to and entering the stream channel may disturb streambanks. However, impacts would be minimized by following ODFW guidelines for timing of in-water work when flows are low and potential for erosion is negligible, minimizing the number of equipment access points through riparian areas and along streambanks, and planting or seeding any disturbed sites prior to winter rains. The amount of actively eroding streambank is not expected to increase. **Maintain**.

Alternative 3: Heavy equipment adjacent to the stream channel may disturb streambanks. However, impacts would be minimized by following ODFW guidelines for timing of in-water work when flows are low and potential for erosion is negligible, minimizing the number of equipment access points through riparian areas and along streambanks, and planting or seeding any disturbed sites prior to winter rains. Keeping equipment out of the stream channel may cause more bank disturbance than in Alternative 2, however, the amount of actively eroding streambank is not expected to increase. **Maintain**.

Floodplain Connectivity: A general lack of large wood and the presence of Elk Creek Access Road and old logging roads have reduced connections between portions of Elk Creek and its floodplain. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at

least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since large wood is an important part of maintaining floodplain connections, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood improves connections between the stream channel and the floodplain, and creates off-channel habitat. **Restore**.

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood improves connections between the stream channel and the floodplain, and creates off-channel habitat. **Restore**.

Watershed Conditions

Road Density and Location: In general, road densities are high in the Elk Creek subwatershed. The Elk Creek Road impinges on the stream channel in the lower watershed. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Since no roads would be built or decommissioned, this indicator would be **Maintained.**

Alternative 3: Since no roads would be built or decommissioned, this indicator would be **Maintained.**

Disturbance History: Floods and past management (roads and timber harvest) have disturbed the riparian vegetation along portions of Elk Creek and riparian areas are not providing adequate large wood at this time. Stream enhancement projects implemented in the last decade have added wood as an interim solution. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, some riparian areas within the Nestucca watershed lack conifers for future input of large wood and shading of the stream channel. As current large wood in the stream channel decomposes, and alders growing along the banks grow old there may be lack of shade and little replacement of large wood instream. This indicator may **Degrade** in the long term.

Alternative 2: Addition of large wood to the streams and the floodplains will help supply some of the large wood that the riparian areas currently cannot. Planting native vegetation in the riparian areas will help maintain and restore shading and future input of large wood to the stream channel. **Restore**.

Alternative 3: Addition of large wood to the streams and the floodplains will help supply some of the large wood that the riparian areas currently cannot. Planting native vegetation in the riparian areas will help maintain and restore shading and future input of large wood to the stream channel. **Restore**.

Stream Influence Zone: Due to past timber harvest, floods, fire, and road building, stream influence zones have been somewhat altered (USFS and BLM 1994). **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, some riparian areas within the Nestucca watershed lack conifers for future input of large wood and shading of the stream channel. As current large wood in the stream channel decomposes, and alders growing along the banks grow old there may be lack of shade and little replacement of large wood instream. This indicator may **Degrade** in the long term.

Alternative 2: Addition of large wood to the streams and the floodplains will help supply some of the large wood that the riparian areas currently cannot. Planting native vegetation in the riparian areas will help maintain and restore shading and future input of large wood to the stream channel. **Restore**.

Alternative 3: Addition of large wood to the streams and the floodplains will help supply some of the large wood that the riparian areas currently cannot. Planting native vegetation in the riparian areas will help maintain and restore shading and future input of large wood to the stream channel. **Restore**.

Refugia: Due to past floods and impingement of the road, Elk Creek has little off channel habitat. The lack of large woody debris has been addressed with several stream habitat improvement projects in this area which have improved habitat conditions. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, as current large wood in the stream channel decomposes adequate replacement may not occur, causing a **Degrade** of refugia in the long term.

Alternative 2: Addition of large wood to the stream channel and floodplain and planting native vegetation in the riparian areas will help maintain and **Restore** refugia within the watershed.

Alternative 3: Addition of large wood to the stream channel and floodplain and planting native vegetation in the riparian areas will help maintain and **Restore** refugia within the watershed.

Table 10:CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS FOR THE OREGON COAST RANGE PROVINCE

Administrative Unit: Salem District BLM Basin/Section 7 Watershed: Nestucca - Bear Creek 6th Field Watershed
Project:Nestucca Fish Habitat Enhancement Project - Alternative 1 (No Action)

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS	Properly Functioning	At Risk[1]	Not Proper. Functioning	Restore[2]	Maintain[3]	Degrade[4]
Water Quality: Temperature			X		X	
Turbidity		X			X	
Chem. Contam./Nut.	X				X	
Overall (303d reaches)			X		X	
Habitat Access: Physical Barriers			X		X	
Habitat Elements: Substrate/Sediment		X			X	
Large Woody Debris (LWD)			X		X[3]	X[3]
Pool Area %		X			X[3]	X[3]
Pool Quality		X			X[3]	X[3]
Pool Frequency	X				X[3]	X[3]

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS						
Habitat Access: Physical Barriers			X		X^3	X^3
Channel Cond. & Dyn.: Streambank Condition		X			X	
Floodplain Connectivity			X		X^3	X^3
Watershed Condition: Road Des. & Loc.			X		X	
Disturbance History		X			X^3	X^3
Stream Influence Zone		X			X^3	X^3
Refugia		X			X^3	X^3

X^1 - Potential short-term* adverse effects, with long term maintenance of indicator
X^2 - Potential short-term adverse effects, with long term restoration of indicator
X^3 - Possible degrade in the long-term as a result of no action.
X^4 - Short-term maintenance of the indicator, with long-term restoration
*Short term is considered to be the duration of the project, generally 1 year or less, but possibly intermittently up to 3 years.
Note: Effects are based on which way this project is likely to move the relevant indicator, but no change in baseline condition is expected.

Table 11:CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS FOR THE OREGON COAST RANGE PROVINCE

Administrative Unit: Salem District BLM Basin/Section 7 Watershed: Nestucca - Bear Creek 6th Field Watershed
Project:Nestucca Fish Habitat Enhancement Project - Alternative 2

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS	Properly Functioning	At Risk[1]	Not Proper. Functioning	Restore[2]	Maintain[3]	Degrade[4]
Water Quality: Temperature			X		X	
Turbidity		X			X^1	X^1
Chem. Contam./Nut.	X				X	
Overall (303d reaches)			X		X	
Habitat Access: Physical Barriers			X	X		
Habitat Elements: Substrate/Sediment		X		X		
Large Woody Debris (LWD)			X	X		
Pool Area %		X		X		
Pool Quality		X		X		

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS	Properly Functioning	At Risk[1]	Not Proper. Functioning	Restore[2]	Maintain[3]	Degrade[4]
Pool Frequency	X			X		
Off-Channel Habitat			X	X		
Channel Cond. & Dyn.: Streambank Condition		X			X	
Floodplain Connectivity			X	X		
Watershed Condition: Road Des. & Loc.			X		X	
Disturbance History		X		X		
Stream Influence Zone		X		X		
Refugia		X		X		

X[1] - Potential short-term* adverse effects, with long term maintenance of indicator
X[2] - Potential short-term adverse effects, with long term restoration of indicator
X[3] - Possible degrade in the long-term as a result of no action.
X[4] - Short-term maintenance of the indicator, with long-term restoration
*Short term is considered to be the duration of the project, generally 1 year or less, but possibly intermittently up to 3 years.
Note: Effects are based on which way this project is likely to move the relevant indicator, but no change in baseline condition is expected.

Table 12:CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS FOR THE OREGON COAST RANGE PROVINCE

Administrative Unit: Salem District BLM Basin/Section 7 Watershed: Nestucca - Bear Creek 6th Field Watershed Project:Nestucca Fish Habitat Enhancement Project - Alternative 3

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS	Properly Functioning	At Risk[1]	Not Proper. Functioning	Restore[2]	Maintain[3]	Degrade[4]
Water Quality: Temperature			X		X	
Turbidity		X			X[1]	X[1]
Chem. Contam./Nut.	X				X	
Overall (303d reaches)			X		X	
Habitat Access: Physical Barriers			X		X	
Habitat Elements: Substrate/Sediment		X		X		
Large Woody Debris (LWD)			X	X		

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS		X		X		
Pool Quality		X		X		
Pool Frequency	X			X		
Off-Channel Habitat			X	X		
Channel Cond. & Dyn.: Streambank Condition		X			X	
Floodplain Connectivity			X	X		
Watershed Condition: Road Des. & Loc.			X		X	
Disturbance History		X		X		
Stream Influence Zone		X		X		
Refugia		X		X		

X^1 - Potential short-term* adverse effects, with long term maintenance of indicator
X^2 - Potential short-term adverse effects, with long term restoration of indicator
X^3 - Possible degrade in the long-term as a result of no action.
X^4 - Short-term maintenance of the indicator, with long-term restoration
*Short term is considered to be the duration of the project, generally 1 year or less, but possibly intermittently up to 3 years.
Note: Effects are based on which way this project is likely to move the relevant indicator, but no change in baseline condition is expected.

Supporting Rationale for Tables 10-12: Bear Creek Matrix Indicators.

Data on the lower reaches of Bear Creek was collected before an enhancement project was completed in 1994. A partial inventory of the two enhanced reaches conducted in 1996 reflects the most current data available at this time. Data from both sets was used to provide the most complete descriptions of this 6th field watershed. The Bear Creek 6th field watershed contains mainstem Nestucca River as well as several tributaries, including the Bear Creek subwatershed. Projects proposed for this 6th field include Middle Bear Creek enhancement (project 3) and the Alder Glen/Bear Creek mainstem Nestucca enhancement (project 5).

Water Quality

Temperature: Twenty years of water temperature data from the Beaver gauge on the mainstem indicates that temperatures (7 day average maximum) exceeded 68°F during the peak water temperature period in each year. Bear Creek has and is expected to exceed the (7 day average maximum) of 68°F during low flow and high ambient temperature periods according to BLM data which makes this indicator **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Trees felled in the riparian area for instream use would be selected so there would be negligible, if any, reduction in canopy cover over the stream. Removal/disturbance of other vegetation in the riparian area would be limited by minimizing the number of access points through the riparian area, and disturbed areas will be planted or seeded with native vegetation (trees, shrubs, grasses, and/or forbs). **Maintain**.

Alternative 3: Trees felled in the riparian area for instream use would be selected so the would be minimal, if any, reduction in canopy cover over the stream. Removal/disturbance of other vegetation in the riparian area would be limited by minimizing the number of access points through the riparian area, and disturbed areas will be planted or seeded with native vegetation (trees, shrubs, grasses, and/or forbs).. **Maintain**.

Turbidity: The Nestucca River from Powder Creek to the headwaters, which includes this 6th field watershed, is on the 303d list for sedimentation. This indicates that there may be turbidity occurring at higher frequency and duration relative to unimpacted streams within the basin. Bear Creek, which enters the Nestucca River between Elk Creek and the Alder Glen bridge, is a chronic sediment source due to a large natural soil creep area, (USFS and BLM 1994). **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: There would be some turbidity created through the placement of logs and rock in the stream channel and equipment operating within and adjacent to the stream channel. This turbidity would be short-term, and almost exclusively during the actual instream work. Turbidity and impacts on listed fish would be minimized by following ODFW guidelines for timing of in-water work, minimizing the time that heavy equipment is in the stream channel, minimizing the number of equipment access points through riparian areas, and planting or seeding disturbed sites prior to winter rains. Short term **Degrade**, long term **Maintain.**

Alternative 3: There would be some turbidity created through the placement of logs and rock in the stream channel and equipment operating adjacent to the stream channel. This turbidity would be short-term, and almost exclusively during the actual instream work. Turbidity and impacts on listed fish would be minimized by following ODFW guidelines for timing of in-water work, minimizing the number of equipment access points through riparian areas, and planting any disturbed sites prior to winter rains. Precluding equipment from operating within the stream channel may lessen, but would not eliminate turbidity. Short term **Degrade**, long term **Maintain.**

Chemical Contamination/Nutrient Input: The is no evidence of chemical contamination or nutrient input within the 6th field watershed. **Properly Functioning.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: There is a possibility of chemical contamination (fuel/oil/hydraulic fluid spills) due to heavy equipment working in and adjacent to streams. To minimize the chance of spills equipment would be regularly checked for problems, such as leaks and broken hoses. To minimize impacts should a spill occur instream, containment booms would be placed downstream of equipment working in the stream channel. Any spill would be quickly contained and cleaned up, and would only impact a very small portion of the stream. There would be no *chronic* chemical contamination or nutrient input. **Maintain.**

Alternative 3: There is a possibility of chemical contamination (fuel/oil/hydraulic fluid spills) due to heavy equipment adjacent to streams. To minimize the chance of spills equipment would be regularly checked for problems, such as leaks and broken hoses. To minimize impacts should a spill occur instream, containment booms would be placed downstream of equipment working in the stream channel. Any spill would be quickly contained and cleaned up, and would only impact a very small portion of the stream. There would be no *chronic* chemical contamination or nutrient input. **Maintain.**

Overall (303d reaches): The Nestucca River from Powder Creek to the headwaters, which included this 6th field watershed, is on the 303d list for sedimentation. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: There is a possibility of short term turbidity and sediment input into the stream channels through the placement of logs and rock in the stream channel and equipment operating within the stream channel. Turbidity and sediment input would be short-term, and almost exclusively during the actual instream work. Impacts to listed fish would be minimized by following ODFW guidelines for timing of in-water work, minimize time that heavy equipment is in the stream channel, minimizing the number of equipment access points through riparian areas, and planting or seeding any disturbed sites prior to winter rains. This project would not contribute to any additional 303d listings, or help remove this reach from the 303d list for sedimentation. **Maintain.**

Alternative 3: There is a possibility of short term turbidity and sediment input into the stream channels through the placement of logs and rock in the stream channel. Turbidity and sediment input would be short-term, and almost exclusively during the actual instream work. Impacts to listed fish would be minimized by following ODFW guidelines for timing of in-water work, minimize time that heavy equipment is in the stream channel, minimizing the number of equipment access points through riparian areas, and planting or seeding any disturbed sites prior to winter rains. This project would not contribute to any additional 303d listings, or help remove this reach from the 303d list for sedimentation. **Maintain.**

Habitat Access

Physical Barriers: Though no major barriers exist in this subwatershed, several tributaries have culverts suspected of blocking fish passage at some flows. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Instream habitat enhancement work within this 6th field watershed would include maintenance and improvement of existing instream structures. Any existing structures that are found to be blocking fish passage would be modified to allow fish passage. **Restore**.

Alternative 3: Alternative 3 does not include the Ginger Creek culvert replacement. Alternative 3 does not allow equipment within the stream channel, therefore modification of all existing structures blocking fish passage may not be possible. **Maintain**.

Habitat Elements

Substrate/Sediment: Within the Bear Creek 6th field watershed 59% of riffle habitat is gravel dominated, which would be considered properly functioning, however, 18.5% is dominated by organic material and sand. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Addition of large wood to the stream channel which is the primary sorting element in coastal streams would help sort substrate by creating slow water areas (pools, backwater and floodplain access) where fine particle naturally are deposited. The sorting function of large wood in riffle areas helps prevent fine particles from depositing in riffles and increases the percentage of gravels in riffles. **Restore.**

Alternative 3: Same as Alternative 2, except there would be less wood placed, therefore less beneficial effects. **Restore**.

Large Woody Debris: Due to past floods, homesteading activity and management actions, the lower portion of Bear Creek is deficient in large woody debris (USFS and BLM 1994). Even previously enhanced reaches of Bear Creek contain little (< 9 pieces/mile) large wood which is 24 in. diameter and 50 ft. long. Surveyed reaches within the Bear Creek 6th field watershed average 5.2 pieces of LWD/mile. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement and this indicator may **Degrade**.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. **Restore.**

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. **Restore.**

% Area in Pools: Pools make up 39% of the total surveyed reaches. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative, this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since pools are often formed by large wood, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often creates pools, which should increase the amount of area in pools. **Restore.**

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often creates pools, which should increase the amount of area in pools. **Restore.**

Pool Quality: Pools greater than 1 meter deep make up 14% of the total surveyed area. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative, this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since pools, particularly quality pools, are often formed by large wood, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often forms deep, thus there should be an increase in the number of quality pools. **Restore.**

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often forms deep, thus there should be an increase in the number of quality pools. **Restore.**

Pool Frequency: There are 2.1 channel widths between pools. **Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since pools are often formed by large wood, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often creates pools, which would increase the pool frequency. Even though this indicator is considered properly functioning, additional pools will further improve habitat. **Restore.**

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood often creates pools, which would increase the pool frequency. Even though this indicator is considered properly functioning, additional pools will further improve habitat. **Restore.**

Off Channel Habitat: Off channel habitat makes up 2.6% of the total surveyed areas. **Not Properly Functioning.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since pools are often formed by large wood, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood improves connections between the stream channel and the floodplain, and creates off-channel habitat. **Restore**.

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood improves connections between the stream channel and the floodplain, and creates off-channel habitat. **Restore**.

Channel Conditions

Streambank Condition: Surveyed reaches have 38% of streambanks actively eroding. This data was collected soon after the 1996 flood event, therefore current streambank erosion is probably less than 38%. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Heavy equipment adjacent to and entering the stream channel may disturb streambanks. However, impacts would be minimized by following ODFW guidelines for timing of in-water work when flows are low and potential for erosion is negligible, minimizing the number of equipment access points through riparian areas and along streambanks, and planting or seeding any disturbed sites prior to winter rains. The amount of actively eroding streambank is not expected to increase. **Maintain**.

Alternative 3: Heavy equipment adjacent to the stream channel may disturb streambanks. However, impacts would be minimized by following ODFW guidelines for timing of in-water work when flows are low and potential for erosion is negligible, minimizing the number of equipment access points through riparian areas and along streambanks, and planting or seeding any disturbed sites prior to winter rains. Keeping equipment out of the stream channel may cause more bank disturbance than in Alternative 2, however, the amount of actively eroding streambank is not expected to increase. **Maintain**.

Floodplain Connectivity: Lack of large wood and presence of roads, particularly the Nestucca Access Road, has limited or eliminated floodplain connections. **Not Properly Functioning.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, since many riparian areas within the Nestucca watershed lack conifers for future input of large wood, as current large wood decomposes there will be little replacement. Since large wood is an important part of maintaining floodplain connections, this indicator may **Degrade** in the long term.

Alternative 2: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood improves connections between the stream channel and the floodplain, and creates off-channel habitat. **Restore**.

Alternative 3: This alternative includes the addition of large wood to the stream channel and floodplain. Large wood improves connections between the stream channel and the floodplain, and creates off-channel habitat. **Restore**.

Watershed Conditions

Road Density and Location: Road densities are high in the Nestucca watershed and in the Bear Creek 6th field watershed, and some roads are valley bottom roads, including the Nestucca Access Road (USFS and BLM 1994). **Not Properly Functioning.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Since no roads would be built or decommissioned, this indicator would be **Maintained.**

Alternative 3: Since no roads would be built or decommissioned, this indicator would be **Maintained.**

Disturbance History: Floods and past management (roads and timber harvest) have disturbed the riparian vegetation along portions of Bear Creek and the Nestucca River. Riparian areas are not providing adequate large wood at this time. Stream enhancement in the last decade has added wood as an interim solution. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, some riparian areas within the Nestucca watershed lack conifers for future input of large wood and shading of the stream channel. As current large wood in the stream channel decomposes, and alders growing along the banks grow old there may be lack of shade and little replacement of large wood instream. This indicator may **Degrade** in the long term.

Alternative 2: Addition of large wood to the streams and the floodplains will help supply some of the large wood that the riparian areas currently cannot. Planting native vegetation in the riparian areas will help maintain and restore shading and future input of large wood to the stream channel. **Restore**.

Alternative 3: Addition of large wood to the streams and the floodplains will help supply some of the large wood that the riparian areas currently cannot. Planting native vegetation in the riparian areas will help maintain and restore shading and future input of large wood to the stream channel. **Restore**.

Stream Influence Zone: Due to past timber harvest, floods, fire, and road building, stream influence zones have been somewhat altered (USFS and BLM 1994). **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, some riparian areas within the Nestucca watershed lack conifers for future input of large wood and shading of the stream channel. As current large wood in the stream channel decomposes, and alders growing along the banks grow old there may be lack of shade and little replacement of large wood instream. This indicator may **Degrade** in the long term.

Alternative 2: Addition of large wood to the streams and the floodplains will help supply some of the large wood that the riparian areas currently cannot. Planting native vegetation in the riparian areas will help maintain and restore shading and future input of large wood to the stream channel. **Restore**.

Alternative 3: Addition of large wood to the streams and the floodplains will help supply some of the large wood that the riparian areas currently cannot. Planting native vegetation in the riparian areas will help maintain and restore shading and future input of large wood to the stream channel. **Restore**.

Refugia: BLM has implemented several stream habitat improvement projects in this area which have improved habitat conditions. The lack of large woody debris has been addressed with several stream and riparian habitat improvement projects in this area which have improved habitat conditions. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained,** at least in the short term. However, as current large wood in the stream channel decomposes adequate replacement may not occur, causing a **Degrade** of refugia in the long term.

Alternative 2: Addition of large wood to the stream channel and floodplain and planting native vegetation in the riparian areas will help maintain and **Restore** refugia within the watershed.

Alternative 3: Addition of large wood to the stream channel and floodplain and planting native vegetation in the riparian areas will help maintain and **Restore** refugia within the watershed.

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Table 13:CHECKLIST CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS AT THE 5TH-FIELD WATERSHED

Administratiave Unit: Salem District BLM 5th field watershed: Willamina Creek

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS	Properly Functfoning	At Risk	Not Proper. Functioning	Restore	Maintain	Degrade
Water Quality: Temperature			PJ		X	
Turbidity		WA; PJ			X	
Chem. Contam./Nut.			303d		X	

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
INDICATORS (303d reaches)			303d		X	
Habitat Access: Physical Barriers			PJ		X	
Habitat Elements: Substrate/Sediment			ODFW; PJ		X	
Large Woody Debris (LWD)			ODFW		X	
Pool Area %		ODFW			X	
Pool Quality		ODFW			X	
Pool Frequency		ODFW			X	
Off-Channel Habitat			ODFW		X	
Channel Cond. & Dyn.: Streambank Condition			WA; ODFW		X	
Floodplain Connectivity			WA; ODFW		X	
Watershed Condition: Road Des. & Loc.			WA; PJ		X	
Disturbance History			WA; PJ		X	
Stream Influence Zone			WA; PJ		X	
Refugia		WA; PJ; ODFW			X	

PJ - Professional Judgement
WA = *Deer Creek, Panther Creek, Willamina Creek and South Yamhill Watershed Analysis* (BLM 1998)
303d - DEQ 303d list
ODFW - data collected by Oregon Dept. of Fish and Wildlife in 1995 (report dated 1996)

Water Quality

Temperature: The limited water temperature data available for Willamina Creek indicates that water temperatures likely exceed state standards during the summer months. This baseline condition for this indicator is rated **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Removal of a small amount of wood, approximately 200 trees, from several blowdown patches would have no impact on stream temperatures. **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

Turbidity: Watershed analysis states that bank erosion is likely a major contributor to stream sediment load, with erosion potential greatest in the lower reaches. In the lower watershed and especially urban areas streambanks are not well vegetated and some are actively eroding. Stream turbidity levels have been observed to be quite high during winter storm events, which is common in this basin. A lack of large woody debris and associated structural elements in Willamina Creek indicates that sediment storage and routing processes have been disrupted. This indicator is **At Risk.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Trees from the 2 smaller blowdown patches would only be removed by helicopter yarding, which would create very little disturbance, and there would be a 50 foot buffer along all stream from which no trees would be taken, thus there is virtually no chance of increasing turbidity. The larger patch would be yarded by helicopter or possibly a cable system. The work would be done during the dry season, logs/trees would be yarded uphill (away from any streams), there are relatively few trees to be taken (approximately 160 which is less than 50% of the blowdown), and very few if any trees would be removed from RR in the large patch, therefore the possibility of sediment reaching streams and increasing turbidity is negligible. **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

Chemical Contamination/Nutrient Input: A portion of Willamina Creek is listed (303d) for recreation contact fecal coliform bacteria, so this indicator is rated as **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Removing logs from the blowdown patches would not cause any nutrient input to streams. There is a small possibility of a chemical (fuel, hydraulic fluid) leak or spill from equipment used to yard the logs, however the likelihood of any contaminants reaching the stream is negligible and there would be no chronic contamination. **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

Overall (303d reaches): A portion of Willamina Creek is listed (303d) for recreation contact fecal coliform bacteria, so this indicator is rated as **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: This action would not lead to adding or removing any stream reaches from the DEQ 303d list. **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

Habitat Access

Physical Barriers: Within the watershed there are barriers to fish passage and as such is considered **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: No barriers to fish passage would be added or removed as a result of this action. **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

Habitat Elements

Substrate/Sediment: ODFW data (1996) show that reach 1 of Willamina Creek has substrate comprised of 51.7% boulders and bedrock, and 40.6% cobble and gravel. A high percentage of actively eroding banks is probably contributing to excess sediment in the substrate, particularly in the lower portion of the watershed. This reach is considered **Not Properly Functioning** for substrate.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Trees from the 2 smaller blowdown patches would only be removed by helicopter yarding, which would create very little disturbance, and there would be a 50 foot buffer along all stream from which no trees would be taken, thus there is virtually no chance of causing sediment movement into streams. The larger patch would be yarded by helicopter or possibly a cable system. The work would be done during the dry season, logs/trees would be yarded uphill (away from any streams), there are relatively few trees to be taken (approximately 160 which is less than 50% of the blowdown), and very few if any trees would be removed from RR in the large patch, therefore the possibility of sediment reaching streams is negligible. **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

Large Woody Debris: Due to past timber harvest, valley bottom roads, homesteading activity, fire and other management actions, Willamina Creek is deficient in large woody debris (BLM 1998). The standard for key pieces of large wood is 80 pieces/mile that are at least 24 inches in diameter and 50 feet in length. Wood this size was recorded in a 1995 ODFW survey in the amount of 49 pieces in a five mile reach which is about 12% of the desired number. This indicator is considered **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Approximately 200 downed trees would be removed from 3 patches of blowdown, which is less than 50% of the total number of downed trees and standing snags in these patches. A portion of these trees (about 25%) are located in RR along small, non-fish bearing streams. Trees removed would be a minimum of 50 feet away from streams. None of the trees removed would be in the streams or within the floodplains, and due to the topography, the probability of any of these trees moving into the streams in the future and functioning as large woody debris is low. **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

Pool Area %: Percent of area in pools for Willamina Creek reaches 1-6 is 41%, however the surveyed tributaries all have less than 30% area as pools. **At Risk.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Approximately 200 downed trees would be removed from 3 patches of blowdown, which is less

than 50% of the total number of downed trees and standing snags in these patches. A portion of these trees (about 25%) are located in RR along small, non-fish bearing streams. Trees removed would be a minimum of 50 feet away from streams. None of the trees removed would be in the streams or within the floodplains, and due to the topography, the probability of any of these trees moving into the streams in the future and increasing the amount of pool habitat is low. **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

Pool Quality: In reaches 1-6 of the mainstem of Willamina Creek the percent of pools that are greater than 1 meter in depth is 39% of all pools, and data from surveyed tributaries show 22-33% of all pools are greater than 1 meter in depth, except one (Cedar Creek Tributary A) which had no pools greater than 1 meter. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Approximately 200 downed trees would be removed from 3 patches of blowdown, which is less than 50% of the total number of downed trees and standing snags in these patches. A portion of these trees (about 25%) are located in RR along small, non-fish bearing streams. Trees removed would be a minimum of 50 feet away from streams. None of the trees removed would be in the streams or within the floodplains, and due to the topography, the probability of any of these trees moving into the streams in the future and increasing the amount of quality pool habitat is low. **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

Pool Frequency: In reaches 1-6 of the mainstem of Willamina Creek there is approximately 16 wetted channel widths between pools and 9.7 active channel widths between pools, which would be considered at risk. The tributaries of Willamina Creek that have been surveyed range from having 30 to 123 wetted channel widths between pools and 15 to 55 active channel widths between pool, however, some of these tributaries are steep (not Rosgen Type C) and would not be expected to < 8 channel widths between pools. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Approximately 200 downed trees would be removed from 3 patches of blowdown, which is less than 50% of the total number of downed trees and standing snags in these patches. A portion of these trees (about 25%) are located in RR along small, non-fish bearing streams. Trees removed would be a minimum of 50 feet away from streams. None of the trees removed would be in the streams or within the floodplains, and due to the topography, the probability of any of these trees moving into the streams in the future and increasing the amount of pool habitat is low. **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

Off-Channel Habitat: There is little to no backwater or off-channel areas within the surveyed reaches of mainstem Willamina Creek and tributaries. **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Approximately 200 downed trees would be removed from 3 patches of blowdown, which is less than 50% of the total number of downed trees and standing snags in these patches. A portion of these trees (about 25%) are located in RR along small, non-fish bearing streams. Trees removed would be a minimum of 50 feet away from streams. None of the trees removed would be in the streams or within the floodplains, and due to the

topography, the probability of any of these trees moving into the streams in the future and increasing the amount of off-channel habitat is low. **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

Channel Conditions

Streambank Condition: Data collected during a 1995 ODFW stream survey on the upper portion of Willamina Creek indicated as much as 67% of the streambanks were actively eroding. Watershed analysis states that bank erosion is likely a major contributor to stream sediment load, with erosion potential greatest in the lower reaches. In the lower watershed and especially urban areas streambanks are not well vegetated and some are actively eroding. This indicator is **Not Properly Functioning.**

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: The action would not impact streambanks. **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

Floodplain Connectivity: Floodplain connectivity is rated as **Not Properly Functioning** due to the lack of large wood, a history of log drives and splash damming that has severely restricted access to the floodplain during high flows.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Approximately 200 downed trees would be removed from 3 patches of blowdown, which is less than 50% of the total number of downed trees and standing snags in these patches. A portion of these trees (about 25%) are located in RR along small, non-fish bearing streams. Trees removed would be a minimum of 50 feet away from streams. None of the trees removed would be in the streams or within the floodplains, and due to the topography, the probability of any of these trees moving into the streams or onto the floodplains in the future and increasing floodplain connectivity is low. **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

Watershed Conditions

Road Density and Location: The Willamina Creek Watershed has a high road density 5.5 miles/mile^2 and in the lower watershed the streams are often confined by roads located in the floodplain. (BLM 1998). **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: No roads would be constructed or obliterated in conjunction with the actions. **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

Disturbance History: Road construction, logging, agricultural and residential/urban development have altered or removed vegetation in many locations throughout the watershed. This indicator is rated as **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Trees from the 2 smaller blowdown patches would only be removed by helicopter yarding, which would create almost no disturbance. The larger patch would be yarded by helicopter or possibly a cable system. The work would be done during the dry season, logs/trees would be yarded uphill (away from any streams), there are relatively few trees to be taken (approximately 160 which is less than 50% of the blowdown), and very few if any trees would be removed from RR in the large patch, therefore the amount of new disturbance created would be negligible. **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

Stream Influence Zone: Road construction, logging, agricultural and residential/urban development have altered or removed riparian vegetation on many of the streams in the watershed. This indicator is rated as **Not Properly Functioning**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Trees would not be removed from 50 feet of any stream, at a minimum, therefore no impacts would occur to any stream influence zone. **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

Refugia: Survey data show that there are areas within the watershed that contain an adequate number of quality pools and some large wood to provide complex habitat. However, there is a lack of off-channel habitat, an overall lack of large wood, and the amount and continuity of refugia is limited. **At Risk**.

Alternative 1: Since Alternative 1 is the "No Action" alternative this matrix indicator would be **Maintained.**

Alternative 2: Removal of a portion of the downed trees from the blowdown patches would not reduce the amount of large wood in the streams, pool habitat or off-channel habitat, therefore would not reduce the amount and continuity of refugia within the watershed. **Maintain**.

Alternative 3: Same as Alternative 2. **Maintain**.

References:

Bureau of Land Management. 1998. Deer Creek, Panther Creek, Willamina Creek and South Yamhill Watershed Analysis. 85pp + appendices.

Oregon Department of Fish and Wildlife and USDI Bureau of Land Management. 1996. Stream Habitat Surveys. Aquatic Inventories Project, ODFW Research and Development.

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APPENDIX 5

Aquatic Conservation Strategy

Environmental Assessment Number OR-086-00-02

Documentation of Consistency with Aquatic Conservation Strategy in the Nestucca River Watershed

ACS Objective 1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

Alternative 1: The current distribution, diversity and complexity of watershed and landscape-scale features would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 1.**

Alternative 2: Implementation of Alternative 2 would restore ACS Objective 1. The addition of large wood and rock to the stream channel would increase the diversity and complexity of aquatic habitat within the Nestucca River watershed. Riparian planting may increase diversity of riparian areas. **Restores ACS Objective 1.**

Alternative 3: Same as for Alternative 2 except less of the habitat would be restored. **Restores ACS Objective 1.**

ACS Objective 2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. The network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian dependent species.

Alternative 1: The current condition of connectivity would be maintained. The culvert at Ginger Creek would continue to obstruct fish passage, which is currently limiting connectivity within the watershed. **Maintains the current condition of ACS Objective 2; prevents restoration of ACS Objective 2 by not replacing the culvert.**

Alternative 2: Implementation of Alternative 2 would restore connectivity within the watershed. Addition of large wood and boulders would help restore the connection between the active channel and the floodplain. Riparian planting would help increase canopy cover within Riparian Reserves, which would maintain and possibly decrease (restore) water temperature, improving the aquatic connections, and maintain and restore connectivity within and between Riparian Reserves. In addition, connectivity would be restored by replacing the Ginger Creek culvert to allow fish passage at all flows for all life stages. **Restores ACS Objective 2.**

Alternative 3: Same as Alternative 2, except less wood and few, if any, boulders would be used, and the Ginger Creek culvert would not be replaced **Restores ACS Objective 2 in part, except prevents restoration of ACS Objective 2 by not replacing the culvert.**

ACS Objective 3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

Alternative 1: The current condition of the physical integrity of the aquatic system would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 3.**

Alternative 2: Addition of large wood and boulders would help maintain and restore the physical integrity of the streams. Large wood and boulders armor streambanks. Large wood retains substrate on top of bedrock stream bottoms and also creates scour in the substrate to form pools. **Maintains and restores ACS Objective 3.**

Alternative 3: Same as Alternative 2, except less wood and few, if any, boulders would be used. **Maintains and restores ACS Objective 3.**

ACS Objective 4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

Alternative 1: The current condition of water quality would generally be maintained within the drainage. However, as a result of not replacing the Ginger Creek culvert there is a possibility of failure of the culvert because it is undersized, which would cause a substantial increase in turbidity. **Does not prevent the attainment of ACS Objective 4, but may retard if culvert failure occurs and results in excessive turbidity**.

Alternative 2: There would be some turbidity created through the placement of logs and rock in the stream channel and equipment operating within and adjacent to the stream channel. This turbidity would be short-term, and almost exclusively during the actual instream work. Replacement of the Ginger Creek culvert would also cause turbidity, both during instream work and most likely during the first high flow event following the culvert replacement. Turbidity would be minimized by following ODFW guidelines for timing of in-water work, minimizing the time that heavy equipment is in the stream channel, minimizing the number of equipment access points through riparian areas, and planting or seeding disturbed sites prior to winter rains. Addition of large wood to the stream channel may help reduce turbidity, and thus restore water quality, in the long-term by armoring streambanks, which would reduce bank erosion, and reducing scour by lowing water velocity. Replacement of the Ginger Creek culvert would better accommodate high flows and reduce risk of culvert failure, thus reducing potential for excessive turbidity.

There is a possibility of chemical contamination (fuel/oil/hydraulic fluid spills) due to heavy equipment working in and adjacent to streams. To minimize the chance of spills, equipment would be regularly checked for problems, such as leaks and broken hoses. To minimize impacts should a spill occur instream, containment booms would be placed downstream of equipment working in the stream channel. Any spill would be quickly contained and cleaned up, and would only impact a very small portion of the stream. There would be no *chronic* chemical contamination or nutrient input. **Maintains and restores ACS Objective 4**.

Alternative 3: Same as Alternative 2 except no equipment would be operating in the stream channel, so there may be slightly less turbidity and chance for fuel/oil/hydraulic fluid spills. Less potential restoration due to less large wood placed. As a result of not replacing the Ginger Creek culvert there is a possibility of failure of the culvert because it is undersized, which would cause a substantial increase in turbidity. **Does not prevent the attainment of ACS Objective 4, but may retard if culvert failure occurs and results in excessive turbidity**.

ACS Objective 5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

Alternative 1: In general the current condition of the sediment regime would be maintained. As a result of not replacing the Ginger Creek culvert there is a possibility of failure of the culvert because it is undersized. This may result in excessive sediment input to the stream channel. **Does not prevent the attainment of ACS Objective 5, but may retard if culvert failure occurs and results in excessive sediment input and movement**.

Alternative 2: Sediment regime within the stream channel would be maintained and restored. Addition of large wood and boulders to the stream channel may help reduce sediment input to the stream in the long-term by armoring streambanks, which would reduce bank erosion, and reducing scour by lowing water velocity. Large wood and boulders create pools and low velocity areas where sediment drops out of the water column and is stored. Replacement of the Ginger Creek culvert would better accommodate high flows and reduce risk of culvert failure, thus reducing potential for excessive sediment input to the stream channel. **Maintains and restores ACS Objective 5**.

Alternative 3: Same as Alternative 2 with regard to wood and boulder placement except that less would occur. As a result of not replacing the Ginger Creek culvert there is a possibility of failure of the culvert because it is undersized. This may result in excessive sediment input to the stream channel. **Does not prevent the attainment of ACS Objective 5, but may retard if culvert failure occurs and results in excessive sediment input and movement**.

ACS Objective 6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

Alternative 1: The current condition of in-stream flows would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 6.**

Alternative 2: The project would have no impact on instream flows. **Maintains and does not retard or prevent the attainment of ACS Objective 6.**

Alternative 3: The project would have no impact on instream flows. **Maintains and does not retard or prevent the attainment of ACS Objective 6.**

ACS Objective 7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

Alternative 1: The current condition of floodplain inundation and water tables would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 7.**

Alternative 2: Currently there are locations within the Nestucca watershed where the stream channel has been downcut and streams do not have access to the floodplains except during extremely high flow events. Addition of large wood to streams and floodplains would help restore floodplain connections and thus restore the timing, variability and duration of floodplain innundation. **Maintains and restores ACS Objective 7.**

Alternative 3: Same as Alternative 2, except less habitat would be restored. **Maintains and restores ACS Objective 7.**

ACS Objective 8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

Alternative 1: The current condition of plant communities within riparian areas would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 8.**

Alternative 2: Riparian vegetation would be disturbed at equipment access points, however these areas comprise a very small percentage of the riparian area within the watershed. In addition, all areas disturbed during instream work would be planted and/or seeded with native vegetation. Additional riparian planting is proposed to increase shading of stream channels, increase plant diversity or to reestablish native vegetation where introduced species occur. Overall, the species composition and structural diversity of plant communities in riparian areas would be maintained and restored. **Maintains and restores ACS Objective 8.**

Alternative 3: Same as Alternative 2. **Maintains and restores ACS Objective 8.**

ACS Objective 9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.

Alternative 1: The current condition of habitat to support riparian-dependent species would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 9.**

Alternative 2: Riparian vegetation and habitat for riparian dependent species would be disturbed at equipment access points, however these areas comprise a very small percentage of the riparian area within the watershed. In addition, all areas disturbed during instream work would be planted and/or seeded with native vegetation. Additional riparian planting and addition of large wood to stream channels and floodplains would restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species. **Maintains and restores ACS Objective 9.**

Alternative 3: Same as Alternative 2. **Maintains and restores ACS Objective 9.**

Documentation of Consistency with Aquatic Conservation Strategy in the Willamina Creek Watershed

ACS Objective 1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

Alternative 1: The current distribution, diversity and complexity of watershed and landscape-scale features would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 1.**

Alternative 2: Approximately 200 downed trees would be removed from 3 patches of blowdown, which is less than 50% of the total number of downed trees and standing snags in these patches. A portion of these trees (about 25%) are located in RR along small, non-fish bearing streams. Trees removed would be a minimum of 50 feet away from streams. Removal of a portion of these trees would not change the character of the blowdown patches, and they would still provide diversity and complexity to the watershed. The *Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area,* 1998 (LSRA) identifies all of the lands where activities would occur as *Core* Landscape Zone and *Mixed Seral* Cell. In general the goals of this landscape cell are to create new and enlarge existing patches of late-seral forest habitat. The LSRA indicates that much of the forest lands in the AMA contain much lower levels of coarse woody debris (CWD) than would be expected naturally. Some of the reasons for this are that the area has been burned repeatedly in a relatively short period of time, much of the sound large logs were salvaged, and many of the stands that are currently reaching maturity and would have begun to contribute CWD were thinned in the 1960's and 1970's, thus removing those trees that would have otherwise become CWD. Though the trees removed would be moved to a different watershed, the proposed action would, in affect, redistribute CWD from a few areas where it is abundant to other areas within the LSR where it is deficit; and convert some of it from terrestrial habitat to aquatic habitat. **Maintains and does not retard or prevent the attainment of ACS Objective 1.**

Alternative 3: Same as for Alternative 2. **Maintains and does not retard or prevent the attainment of ACS Objective 1.**

ACS Objective 2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. The network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian dependent species.

Alternative 1: The current connectivity within and between watersheds would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 2.**

Alternative 2: Approximately 200 downed trees would be removed from 3 patches of blowdown, which is less than 50% of the total number of downed trees and standing snags in these patches. A portion of these trees (about 25%) are located in RR along small, non-fish bearing streams. Trees removed would be a minimum of 50 feet away from streams. None of the trees removed would be in the streams or within the floodplains, and due to the topography, the probability of any of these trees moving into the streams or onto the floodplains in the future and increasing floodplain connectivity is low. The amount of downed trees and standing snags retained in the patches would ensure that connectivity is maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 2.**

Alternative 3: Same as for Alternative 2. **Maintains and does not retard or prevent the attainment of ACS Objective 2.**

ACS Objective 3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

Alternative 1: The current physical integrity of the aquatic system would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 3.**

Alternative 2: Yarding systems would create very little disturbance, and no logs would be taken from within 50 feet of any stream, therefore the physical integrity of the aquatic system would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 3.**

Alternative 3: Same as for Alternative 2. **Maintains and does not retard or prevent the attainment of ACS Objective 3.**

ACS Objective 4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

Alternative 1: The current water quality would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 4.**

Alternative 2: Trees from the 2 smaller blowdown patches would only be removed by helicopter yarding, which would create very little disturbance, and there would be a 50 foot buffer along all stream from which no trees would be taken, thus there is virtually no chance of impacting water quality by increasing turbidity. The larger patch would be yarded by helicopter or possibly a cable system. The work would be done during the dry season, logs/trees would be yarded uphill (away from any streams), there are relatively few trees to be taken (approximately 160 which is less than 50% of the blowdown), and very few if any trees would be removed from RR in the large patch, therefore the possibility of sediment reaching streams and increasing turbidity is negligible. There is a small possibility of a chemical (fuel, hydraulic fluid) leak or spill from equipment used to yard the logs, however the likelihood of any contaminants reaching the stream is negligible and there would be no chronic contamination. **Maintains and does not retard or prevent the attainment of ACS Objective 4.**

Alternative 3: Same as for Alternative 2. **Maintains and does not retard or prevent the attainment of ACS Objective 4.**

ACS Objective 5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

Alternative 1: The current condition of the sediment regime would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 5.**

Alternative 2: Trees from the 2 smaller blowdown patches would only be removed by helicopter yarding, which would create very little disturbance, and there would be a 50 foot buffer along all stream from which no trees would be taken, thus there is virtually no chance of causing sediment movement into streams. The larger patch would be yarded by helicopter or possibly a cable system. The work would be done during the dry season, logs/trees would be yarded uphill (away from any streams), there are relatively few trees to be taken (approximately 160 which is less than 50% of the blowdown), and very few if any trees would be removed from RR in the large patch, therefore the possibility of sediment reaching streams, is negligible, and there would be no disruption of the sediment regime in the watershed. **Maintains and does not retard or prevent the attainment of ACS Objective 5.**

Alternative 3: Same as for Alternative 2. **Maintains and does not retard or prevent the attainment of ACS Objective 5.**

ACS Objective 6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

Alternative 1: The current in-stream flows would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 6.**

Alternative 2: Removing a portion of the trees from several blowdown patches would have no effect on instream flows. **Maintains and does not retard or prevent the attainment of ACS Objective 6.**

Alternative 3: Same as for Alternative 2. **Maintains and does not retard or prevent the attainment of ACS Objective 6.**

ACS Objective 7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

Alternative 1: The current timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 7.**

Alternative 2: Approximately 200 downed trees would be removed from 3 patches of blowdown, which is less than 50% of the total number of downed trees and standing snags in these patches. A portion of these trees (about 25%) are located in RR along small, non-fish bearing streams. Trees removed would be a minimum of 50 feet away from streams. None of the trees removed would be in the streams or within the floodplains, and due to the topography, the probability of any of these trees moving into the streams or onto the floodplains in the future and increasing floodplain connectivity is low. The amount of downed trees and standing snags retained in the patches would ensure that floodplain connectivity is maintained, and thus the current level of floodplain innundation would also be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 7.**

Alternative 3: Same as for Alternative 2. **Maintains and does not retard or prevent the attainment of ACS Objective 7.**

ACS Objective 8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

Alternative 1: The current species composition and structural diversity of plant communities in riparian areas and wetlands would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 8.**

Alternative 2: Approximately 200 downed trees would be removed from 3 patches of blowdown, which is less than 50% of the total number of downed trees and standing snags in these patches. A portion of these trees (about 25%) are located in RR along small, non-fish bearing streams. Trees from the 2 smaller blowdown patches would only be removed by helicopter yarding, which would create almost no disturbance. The larger patch would be yarded by helicopter or possibly a cable system. The work would be done during the dry season, logs/trees would be yarded uphill (away from any streams), and very few if any trees would be removed from RR in the large patch, therefore the amount of new disturbance created would be negligible. The amount of downed wood and snags that would be maintained on site, and the 50 foot buffer from which no trees would be taken, and the use of a helicopter to yard most, if not all, of the trees, would ensure that the current plant communities within the riparian area are maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 8.**

Alternative 3: Same as for Alternative 2. **Maintains and does not retard or prevent the attainment of ACS Objective 8.**

ACS Objective 9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.

Alternative 1: The current amount of habitat for riparian dependent species would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 9.**

Alternative 2: Approximately 200 downed trees would be removed from 3 patches of blowdown, which is less than 50% of the total number of downed trees and standing snags in these patches. A portion of these trees (about 25%) are located in RR along small, non-fish bearing streams. Trees from the 2 smaller blowdown patches would only be removed by helicopter yarding, which would create almost no disturbance. The larger patch would be yarded by helicopter or possibly a cable system. The work would be done during the dry season, logs/trees would be yarded uphill (away from any streams), and very few if any trees would be removed from RR in the large patch, therefore the amount of new disturbance created would be negligible. The amount of downed wood and snags that would be maintained on site, and the 50 foot buffer from which no trees would be taken, and the use of a helicopter to yard most, if not all, of the trees, would ensure that the current habitat for riparian-dependent species would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 9.**

Alternative 3: Same as for Alternative 2. **Maintains and does not retard or prevent the attainment of ACS Objective 9.**

APPENDIX 6

Botanical Resources

Environmental Assessment Number OR-086-00-02

INVASIVE EXOTICS/NOXIOUS WEEDS THAT MAY OCCUR IN THE VICINITY OF THE PROPOSED ACTION

SCIENTIFIC NAME	COMMON NAME	BEST ID. SEASON	COMMENTS
PRIORITY I SPECIES - POTENTIAL NEW INVADERS			
Carduus pycnocephalus	Italian thistle	May - June	
Carthamus lanatus	distaff thistle		
Carthamus leucocaulos	whitestem distaff thistle		
Centaurea solstitialis	yellow starthistle		
Centaurea virgata	squarrose knapweed		

Chondrilla juncea	rush skeletonweed	mid July - Frost	
Centaurea calcitrapa	purple starthistle		
Centaurea iberica	Iberian starthistle		
Carduus tenuiflorus	slenderflower thistle		
Lythrum salicaria	purple loosetrife	Aug. - Sept.	
Silybum marianum	milk thistle	Late April - Early June	

PRIORITY II SPECIES - ERADICATION OF NEW INVADERS

Centaurea diffusa	diffuse knapweed	July - Sept.	
Centaurea maculosa	spotted knapweed	July - Oct.	
Centaurea pratensis	meadow knapweed	July - Oct.	
Ulex europarus	gorse	April - Sept.	

PRIORITY III SPECIES - ESTABLISHED INFESTATIONS

Cirsium arvensis	Canada thistle	July - Aug	
Cirsium vulgare	bull thistle	July - Sept	
Cytisus scoparius	Scotch broom	May - June	
Hypericum perforatum	St. Johnswort	June - July	
Senecio jacobaea	tansy ragwort	July - Sept	
Dispacus sylvestris	teasel	July - Oct	moist low places, esp disturbed sites
Rubus discolor	Himalayan blackberry	year round	
Rubus laciniatus	evergreen blackberry	year round	
Phalaris arundinacea	reed canary grass	June - Sept	wet places, esp along roads
Polygonum sachalinense	giant knotweed	June - Oct	
Hedera helix	English ivy		
Ilex aquifolium	English holly		
Senecio sylvaticus	wood groundsel	June - Sept	disturbed soil, waste places
Erechtites arguta	burnweed		

SURVEY AND MANAGE SPECIES POTENTIALLY WITHIN THE VICINITY OF THE PROPOSED ACTION

[1]PB = Protection Buffer Species

	STRATEGY				
SPECIES	1	2	3	4	PB[1]
Lichens					
Hypogymnia duplicata	x	x	x		
Lobaria hallii	x		x		
Lobaria linita	x	x	x		
Pannaria rubiginosa	x		x		
Pseudocyphellaria rainierensis	x	x	x		
Lobaria oregana				x	

Lobaria pulmonaria				*x*	
Lobaria scrobiculata				*x*	
Nephroma bellum				*x*	
Nephroma helveticum				*x*	
Nephroma laevigatum				*x*	
Nephroma parile				*x*	
Nephroma resupinatum				*x*	
Pannaria leucostictoides				*x*	
Pannaria mediterranea			*x*		
Pannaria saubinetii				*x*	
Peltigera collina				*x*	
Peltigera neckeri				*x*	
Peltigera pacifica				*x*	
Pseudocyphellaria anomala				*x*	
Pseudocyphellaria anthraspis				*x*	
Pseudocyphellaria crocata				*x*	
Sticta beauvoisii				*x*	
Sticta fuliginosa				*x*	
Sticta limbata			x		
Calicium abietinum				*x*	
Calicium adaequatum				*x*	
Calicium adspersum				*x*	
Calicium glaucellum				*x*	
Calicium viride				*x*	
Chaenotheca brunneola				*x*	
Chaenotheca chrysocephala				*x*	
Chaenotheca ferruginea				*x*	
Chaenotheca furfuracea				*x*	
Chaenotheca subroscida				*x*	
Chaenothecopis pusilla			*x*		
Cyphelium inquinans				*x*	
Microcalicium arenarium				*x*	
Mycocalicium subtile				*x*	
Stenocybe clavata				*x*	
Stenocybe major				*x*	

	STRATEGY				
SPECIES	1	2	3	4	PB[1]
Cetralia cetrarioides				*x*	
Collema nigrescens				*x*	
Leptogium burnetiae var. hirsutum				*x*	

Leptogium cyanescens					*x*	
Leptogium saturninum					*x*	
Leptogium teretiusculum					*x*	
Platismatia lacunosa					*x*	
Ramalina thrausta					*x*	
Usnea longissima					*x*	
Dermatocarpon luridum		*x*		*x*		
Hydrothyria venosa		*x*		*x*		
Leptogium rivale		*x*		*x*		
Bryoria subcana		*x*		*x*		
Hypogymnia oceanica		*x*		*x*		
Loxosporopsis corallifera		x		x		
Cladonia norvegica					*x*	
Heterodermia sitchensis					*x*	
Hygomnia vittiata					*x*	
Hypotrachyna revoluta				*x*		
Ramalina pollinaria					*x*	
Nephroma isidiosum					*x*	
Bryophytes						
Antitrichia curtipendula					*x*	
Bartramiopsis lescurii		*x*		*x*		
Brotherella roelli		*x*		*x*		
Buxbaumia viridis						*x*
Diplophyllum albicans		*x*		*x*		
Diplophyllum plicatum	*x*	*x*				
Douinia ovata				*x*		
Herbertus aduncus		*x*		*x*		
Iwatsukiella leucotricha		*x*		*x*		
Kurzia makinoana		*x*	*x*			
Marsupella emarginata var. aquatics		*x*	*x*			
Plagiochila satoi		*x*		*x*		
Pleuroziopsis ruthenica		*x*		*x*		
Racomitrium aquaticum		*x*		*x*		
Rhizomnium nudum						*x*
Scouleria marginata				*x*		
Tetraphis geniculata		*x*		*x*		*x*
Tritomaria exsectiformis		*x*	*x*			
Vascular Plants						
Allotropa virgata		*x*	*x*			
Botrichium minganense		*x*	*x*			
Coptis aspleniifolia		*x*	*x*			

Corydalis aqua-gelidae	*x*	*x*
Cypripedium montanum	*x*	*x*

FUNGI SPECIES REQUIRING SURVEYS UNDER THE CURRENT ROD (this may change should the new SEIS be adopted prior to field work)

[1]PB = Protection Buffer Species

	STRATEGY				
SPECIES	1	2	3	4	PB[1]
Bondarzewia mesenterica	*x*	*x*	*x*		
Otidea leporina			*x*		*x*
Otidea onotica		*x*		*x*	
Otidea smithii	*x*		*x*		*x*
Polyozellus multiplex	*x*		*x*		*x*
Sowerbyella rhenana	*x*		*x*		*x*

6840 SPECIES POSSIBLY OCCURRING WITHIN THE PROJECT AREA

SPECIES & STATUS	HABITAT	ELEV (FT)	BEST I.D. SEASON	Type
STATE ENDANGERED				
Cordylanthus maritimus Nutt ex Benth. ssp. *palustris* (Behr) Chuang & Heckard Salt marsh bird's-beak	Coos, Lane, Linc, Till			v
BUREAU SENSITIVE (BS)				
Cimicifuga elata Nutt. tall bugbane	WV, WC: Clac, Linn, Mari, Mult Moist, cool, woods, north slopes, usu. assoc. w/ big leaf maple and sword fern	<2000	June-Aug	v
Corydalis aquae-gelidae Peck & Wilson cold-water corydalis	WC; Clac, Linn, Mari, Mult Cold springs and streams	>1000	Mid June-July	v
Dodecatheon austrofrigidum Chamb. ined. frigid shootingstar	CR; Clat, Till shallow soils deposited on basaltic bedrock by floodwaters, or among mosses & short herbs which colonize moist rock			v
Filipendula occidentalis (S. Watson) How. queen-of-the-forest	Clat, Linc, Polk, Till Rock crevices just above high water, full sun or partial shade		June - July	v
Montia howelli S. Watson Howell's montia	WV, WC Clac, Linn, Mult Rocky river banks esp. in disturbed sites	<2500	April - early May	v

ASSESSMENT SPECIES (AS)				
Botrychium minganense Vict. gray moonwort	WC, EC, BM, BR; CA, ID, WA; Bake, Croo, Gran, Harn, Hood, Linn, Unio, Wall, Wasc, Whee riparian zones w/ old-growth Thuja plicata, dense shade but also in meadows, alder thickets, shrublands, roadcuts			v
Diplophyllum plicatum Lindb.	CR; Clat, Coos, Linc West slope of the Cascades where cool, humid conditions occur. Substrates include: decayed wood, down logs, conifer trunks, moist north facing cliffs, shaded cliff crevices along river and stream banks, soil of upturned roots			b
Erigeron peregrinus (Pursh) Greene ssp. *peregrinus* var. *peregrinus* wandering daisy	CR; Clat, Till moist meadows, streamsides, or bogs	mid-high	July-Aug	v
Metzgeria temperata Kuwah. nubbly daintyribbons	Till On tree trunks usually shaded near the coast			b
Tetraplodon mnioides (Hedw.) Bruch & Schimp. *in* B.S.G. Black-fruited stink moss, dung moss	CR, WC; Lane, Linc, Mari forming stiff, densely packed sods in old dung or soil and rotten wood enriched by dung, in peatlands as well as drier uplands such as forests, old clearcuts and along roads and trails. Ephemeral			b
Tritomaria exsectiformis (Breidl.) Loeske forest brownwort	WC; Desc, Jeff, Okan, Wash On peaty or humic soil or rotting wood, often on creek banks where perpetually shady, cool and moist	3200-5100 ft		b
Tritomaria quinquedentata (Huds.) Buch	CR; Clat Organic substrates where shady, cool, & moist. Soil over rock			b
TRACKING SPECIES (TS)				
Asterophora parasitica (Bull.:Fr.) Singer	Till			f
Bondarzewia mesenterica (Schaeff.) Kreisel	CR, WV; Bent, Coos, Linc, Mult late successional forest, often on stumps			f
Bryoria bicolor (Ehrh.)Brodo & D. Hawksw.	CR; Clat, Till, Linc			l

Bryoria subcana (Nyl. Ex Stizenb.) Brodo & D. Hawksw	CR, WC; Bent, Clac, Clat, Coos, Lane, Till wet Picea, Abies and Pseudotsuga forest within 50 miles of coast	low-high		l
Castilleja ambigua H. & A. ssp. *ambigua* johnny-nip	Clat, Coos, Curr, Doug, Lane, Linc, Till			v
Chamonixia caespitosa Rolland	Linc, Till			f
Clitocybe senilis (Fries) Gillet	Till			f
Dichostereum boreale (Pouzar) Ginns & Lefebvre	Till			f
Erythronium revolutum Smith coast fawn-lily	Clat, Coos, Curr, Bent, Doug, Lane, Linc, Polk, Till, Yamh Along river banks or in edge of woods in open or mod. shade. More freq. near coast		April - May	v
Najas guadalupensis (Sprengel) Magnus common water-nymph	Clat?, Lane?, Linc?, Till? Freshwater			v
Niebla cephalota (Tuck.) Rundel & Bowler	CR; Coos, Curr, Lane, Linc, Linn, Mari			l
Nolanea edulis var.*concentrica* Largent	Till			f
Nolanea staurospora var.*incrustata* forma *incrustata* Largent & Thiers	Hood, Jeff, Till			f
Phaeocollybia gregaria Smith & Trappe	Linc, Till			f
Phaeocollybia lilacifolia A.H. Smith	Linc, Till			f
Platyhypnidium riparioides (Hedw.) Dix.	Coos, Lane, Linc, Till			b
Poa laxiflora Buckl. Loose-flowered bluegrass	WC Clac, Mult, Bent. Moist woods to rocky open slopes.	Low	June	v
Poa marcida Hitchc. weak bluegrass	Clac, Clat, Linc,Mult, Polk, Till, Yamh Moist areas in coastal mountains		June - July	v
Pseudocyphellaria rainierensis Imshaug	Clac, Lane, Linc, Linn, Mari, Polk, Till			l
Radiigera bushnellii L.S. Dominguez & Castellano	Till, Yamh			f
Rhinanthus crista-galli L. yellow rattle	Clat, Till Meadows, fields, and moist slopes	various	June - Aug	v

Triglochin striata Ruiz & Pavon three-ribbed arrow-grass	Coos, Curr, Lane, Till Generally in wet places, often where saline or alkaline			v
Tuber asa Tulasne & Tulasne	CR; Bent, Till Assoc. w/ Douglas-fir and western hemlock	170-500m	July & Oct	f
Usnea hesperina Mot.	CR, WV; Bent, Coos, Curr, Doug, Jack, Lane, Linn, Till			l
Usnea rubicunda Stirton	CR; Coos, Lane, Linc, Till			l

APPENDIX 7

(Reserved for) Public Comments to the Environmental Assessment and Bureau Responses

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